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EDUCATION AND THE WAR

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Certainly any thorough discussion of education and the war would require more time than has been allotted to the present speaker and more patience than is possessed by the present listeners. Consequently I and also you must be content with a brief and sketchy interpretation of the educational scene as I have observed it, particularly during the past six or eight months. My attention will be focused on the portions of the scene that have a war relation to the institutions ordinarily classified as higher institutions—colleges, universities and professional and technical schools.

Since the days when the dark clouds of war began to gather on the national horizon, American schools from the lowest to the highest have exhibited an energetic anxiety to give conclusive proof of their loyal usefulness as instruments for the increase of the national might demanded for victory. Teachers and students, day by day, have stood fast, as minute men, ready to respond instantly. There is not a community anywhere in the country that is not indebted to its schools for giving new reality to the lessons of public service. Every program designed to arouse and to unify the people has turned to schools for help, and that help has been given without stint.

Today all the people are being matriculated in the College for War. The struggle for human freedom has packed the words labor, learning and liberty with new meanings. These meanings constitute the assigned lessons for millions, and these lessons are not easy. We who thought of ourselves as an educated nation now realize the essential difficulties of educating the educated, of educating for war those who have long been habituated to the ways of peace, of training those concerned with self interest so that they become more concerned with the survival of the ideals of the nation.

For the first time we of the United States are faced by the grim facts of the scarcity of the things needed for the victorious battle. We now know, as never before, that our resources of nature and of manpower are limited and that these resources must be mobilized with skill and foresight and allotted with yet more skill and more foresight. New rules must be accepted and practiced if we are to escape famines—famine of metals, of munitions, of machines, of money, of medicine, of food and of fuel, and above all famine of trained manpower. Teaching has become a critical war occupation. The teacher in areas of war technology has become as necessary as tanks and torpedoes.

My connection with the War Manpower Commission began last June. Then I assumed responsibility for what was known as the Division of Technical Employment and Training. This division, according to a particular administrative order, was charged with the following special duties:

1. To review the organization and operations of the Engineering, Science and Management War Training Program of the Office of Education to insure effective utilization of the higher, technical and professional institutions for the training of personnel needed for the armed forces, for essential industrial and agricultural production and for governmental services.

2. To direct the activities of the National Roster of Scientific and Specialized Personnel through the head of that office to insure the proper discharge of responsibilities for the development of information as to the qualifications and availability of professional and technical workers for the armed forces, war industries and governmental war activities.

3. To direct the activities of the Office of Procurement and Assignment through the head of that office to insure proper discharge of responsibilities for the recruitment of physicians, dentists and veterinarians for the armed forces and for essential civilian purposes.

4. To be responsible for the coordination of the work of the various agencies and offices under his jurisdiction and for the elimination of any duplication.

5. To recommend to the director of operations, for execution in various regions, such action as may be necessary to secure adequate training, classification, employment transfer and placement of professional and technical workers.

6. To establish effective working relations with the regional offices of the War Manpower Commission so as properly to advise and to counsel the regional manpower directors on specific problems in their regions relating to the training and employment of professional and technical workers.

7. To assemble current information as to the functions, programs and activities of the several administrative divisions of the War Manpower Commission having relationship to the training and employment of professional and technical workers, consulting with the heads of such divisions to arrive at a common understanding of the scope of activities of each division.

8. To establish and maintain effective relations with other governmental agencies concerned with the training and employment of professional and technical personnel essential for the national war effort to promote general acceptance of the program and policies of the War Manpower Commission.

Read before the Thirty-Ninth Annual Congress on Medical Education and Licensure, Chicago, Feb. 15, 1943.

9. To establish and maintain such relations with the higher educational institutions, and with the associations representing those institutions, as will increase their usefulness to the national war effort.

Truly a heavy requisition for a staff which most of the time consisted of myself and one clerical assistant. Whatever the limitations of accomplishment, it has been my principal duty to be concerned with the training and the supply of professional and technical personnel. Modern warfare makes heavy and heavier demands on these sections of our manpower. We know that we have an insufficient supply of physicians, of engineers, of chemists, of physicists, of scientific research workers and of other specialized technologists requiring prolonged training. What proportion of this supply shall be allotted to the armed forces, to the war industries and to the maintenance of essential governmental and civilian activities? What plans shall be followed to step up the production of these critically important workers?

At best, it must be admitted that we have proceeded in an uncertain, catch as catch can fashion. If the war is not to be too prolonged, we shall muddle through. On the other hand, if the war is to continue for three, four, five years, then we may be self convicted of short sightedness for not devising formulas for a better balance of supply and needs and for not insuring a continuous flow of trained men and women for the essential service of a nation at war.

Two months ago the War Manpower Commission effected certain internal reorganizations and reallocations of responsibilities. The activities of the commission were divided among five bureaus—Selective Service, Placement, Program Planning and Control, Training, and Labor Utilization. Thus the division with which I have been connected became the Division of Professional and Technical Training within the Bureau of Training. All matters relating to employment were assigned to the Bureau of Placement. To this bureau went the National Roster of Scientific and Specialized Personnel and the Procurement and Assignment Service.

Here may I digress for a moment and express the rare personal satisfaction I have had from working with Dr. Frank Lahey and his associates on the directing board of the Procurement and Assignment Service, with Commander Lapham and with that dynamic stimulator of the minds and actions of men, Dr. Morris Fishbein. From these lamps of medicine my own feeble candles have been kept lighted. I have been permitted to see something of the mighty strength of the professions of medicine and dentistry and to have a new understanding of their problems and their lacks.

At the present time the Division of Professional and Technical Training is chiefly concerned with the following:

1. Serving as a liaison for the War Manpower Commission with the War and Navy departments, with special emphasis on the utilization of the colleges, universities and technical schools for the several forms of special training needed by the armed forces. During recent weeks three members of the staff of the division have acted as members of the joint committee, representing the Army, Navy and War Manpower Commission, established for the selection of nonfederal educational institutions to be used by the Army and Navy in connection with the specialized training programs. It is estimated that these programs will involve the training of approximately 300,000 young men during the coming year.

2. Promoting ways and means for increased attention to training through higher educational institutions in the various professional and technical fields—engineering, medicine, physics, pharmacy, chemistry, mathematics, nursing, teaching—with special reference to the needs of war industries and of essential civilian activities. This has emphasized the importance of knowing far more accurately than at present the quality and quantity of these needs. At the present time surveys of these needs are under way by governmental agencies and by industrial and professional organizations.

3. Continuing the organization and stimulating the activities of consultative committees representing the various professional and technical groups. These committees are concerned with maintaining the supply of trained personnel for the direct as well as for the indirect needs of the war effort. This has meant that considerable attention has been devoted, and continues to be devoted, to the formulation of policies for the deferment, under the Selective Service System, of students in the fields of critical scarcity.

May I append to this crude and wholly inadequate sketch a brief observation or two as to the future, immediate and remote.

Twenty or more years ago I was led to call attention to what I characterized as the struggle then going on in the world for the possession of the minds and the ability of youth. It was my conclusion that the group, the class, the nation succeeding in gaining control of the most of the best of its youth would control the fate of civilization. The happenings throughout the world during the past two decades—especially in Europe—furnish tragic evidence of the outcome of this struggle. Time and circumstance do not permit discussion of this phenomenon in the life of modern mankind. Nevertheless, it is relevant to my subject to call passing attention of the present day struggle for youth going on in our midst. This promises to lead to decisions of far reaching importance as the nation strives to mobilize its full battle strength.

At its meeting on July 29, 1942 the War Manpower Commission considered at length the place of the colleges and universities of the country in the manpower problem. A special committee was appointed to examine into this matter. The report of this committee was presented to, and approved by, the Commission on August 19. This must be regarded as a declaration of national policy as to the youth now in our higher educational institutions and to the youth who will be in these institutions during the period of the war.

In view of the problems presented to all of the so-called professions, it is well to be reminded of one significant position of this declaration of policy:

"All able bodied male students are destined for the armed forces. The responsibility for determining the specific training for such students is a function of the Army and Navy."

Under the inexorable demands of the battle fronts this policy is now being implemented. The effect of such implementation on national life and efficiency may be only roughly forecast. Without question the impact will be painfully felt by all professions. Whence will flow the stream of trained men and women essential for the maintenance of life back of the armed forces? I

leave this question as one which is yet unanswered but must be answered if we are to escape disasters of our own making.

Eight months of experience in Washington have impressed on me the tremendous difficulties in the formulation and application of plans for the best use of education for the purposes of the war. Not the least of these difficulties is the lack of agreement among those who speak and act for education. Education too often does not appreciate the inescapable requirements of global war, and those seeking to fulfil the requisitions of war are not inclined to recognize the limitations and contributions of education. However, in spite of confusions, delays, mistakes and the conflict of prejudices, there is today much encouraging evidence that the rightful place of education in the war power pattern of the nation is becoming clearer. Meanwhile, men of sense and responsibility must assume the trying task of arbitrating between those who persist in seeing education in peace time terms and the extremists—and, believe me, there are many of these—who would close all the institutions of higher education for the duration.

In the making of the decision, it must never be forgotten that the American youth involved represent our chief hope of attaining peace in the world—a peace that will never again find the nation unprepared for war, as it was twenty-five years ago and once more on Dec. 7, 1941—a peace with power to maintain peace among men and nations. Such I consider to be the great task of education and the war.

PREMEDICAL AND MEDICAL EDUCATION AS RELATED TO THE UNITED STATES ARMY

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An invitation to address the Annual Congress on Medical Education and Licensure is a privilege laymen do not ordinarily receive. Consequently, as I reviewed the program and noted the qualifications of the speakers, the thought occurred that perhaps I was invited as an antidote. I accepted the invitation with the belief that I could help the members of the congress understand some of the Army's educational problems and the hope that the Army might thus receive still further aid from the medical profession.

My father practiced medicine and surgery in Winston-Salem, N. C., for many years, and if you will accept my deep respect—my affection—for your profession as a substitute for medical training, we can perhaps find more common ground and more mutual interests than might first be supposed.

Our goals are similar, although the fields in which we work are different. Physicians were the original trained personnel managers, and a physician's interest in his patient transcends the specific treatment he administers. As assistant chief of staff for personnel of the Services of Supply, my responsibilities as well as my interests are primarily with respect to people—how they can best be used in the Army—people as individuals—groups of people—what is best for the man at any given moment, and what fits best into the long range picture.

We have yet another common group in that physicians were among the first to realize that education is a continuous process. It does not stop at any age, nor does it end on the receipt of any academic degree. Physicians, therefore, possibly to a greater extent than any other professional group, are vitally interested in the Army's specialized training plans to provide trained, skilled men to meet Army needs.

I followed the customary educational lines of a man interested in the Army as a career. I thought my formal contacts with education had ended after receipt of a degree from Virginia Military Institute and additional work at the University of the South and the various Army schools which I attended. Within the past few months, however, I have found myself in the center of as interesting and as important a series of educational problems as have ever developed in this country.

It became possible to develop a long range, sound program for the utilization of educational facilities when Congress lowered the draft age to 18. It became apparent, also, that the Army would have to assure itself of an uninterrupted flow of the kinds of specialists which had been provided by colleges and universities. The Secretary of War assigned the responsibility for the development and operation of Army plans for maintaining the flow of these specialists to General Somervell, commanding general of the Services of Supply, and my immediate superior. As a result, an Army Specialized Training Division has been created under my supervision, and I have appointed Colonel Herman Beukema, formerly head of the Department of Economics, Government and History at the United States Military Academy, director of the new division.

The Secretary of War stated the objective as follows:

> The objective of the plan is to meet the need of the Army for specialized, technical training of soldiers on active duty for certain Army tasks for which its own training facilities are insufficient in extent or character. To that end, the Army will contract with selected colleges and universities for the use of their facilities and faculties in effecting such training of selected soldiers in courses prescribed by the Army. This plan will enable the Army to make selections for this training of qualified young men on a broad democratic basis without regard to financial resources.

Army needs include soldiers trained as physicians, dentists, veterinarians, engineers, physicists, mathematicians and experts in rare languages.

In every field with which the Army is concerned we have called on civilian educational experts for counsel as to curriculums and as to methods of selecting men to be assigned to this program. In the case of the medical profession, General Magee and his staff are guiding our work and selecting civilians with whom consultations are held. We recognize that the physicians must be satisfied with the training the men in medicine receive, and I assure you that there is no thought in our minds of shortcutting any of the essentials of medical education. We do expect, of course, that every possible means will be used to compress the periods involved in training.

The Army specialized training program must provide men trained in two broad fields — medical, including dentistry and veterinary medicine, and technical, including engineering, physics, chemistry and psychology.

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In the medical program, the training is for a degree, as there is no such thing as a partially trained physician. The high standards required by the medical profession must be maintained.

In the technical program, the training is not for a degree but is pointed to what might be called Army requirement standards. The technical program has been compressed by increasing the work load and by eliminating work in subjects not required for performance of the Army tasks for which the men are being trained.

Soldiers assigned to the Army specialized training program will be on active duty as members of a unit located at a college or university. They will be under the direction of a commandant, who will be responsible for discipline and control. They will be in uniform, and they will receive the pay and allowances of enlisted men as provided by Army regulations. Housing, feeding, instruction and other services will be provided by contract between the institution and the Army.

These soldiers will rise at 6:30, and from then until taps at 10:30 that night, their day will be as rigorous as it was during the basic military training period. A typical week will include twenty-four hours of academic classroom work, including laboratory periods, and twenty-four hours of supervised study time. In addition, there will be six hours a week of supervised physical conditioning and about five hours a week of military instruction, which will consist of lectures, orientation work, morning formations and some drill. Neither the physical nor the military instruction will require outside preparation. Their purposes are to maintain the physical condition of the men and to refresh their minds on military subjects and information. There will be sufficient free time provided each day for personal affairs, and the men will be off duty from late afternoon on Saturday until the Sunday evening meal.

The Army program is based on a series of twelve week terms. This decision was reached after study and consultation with civilian educators because it is the shortest period in which satisfactory curriculums can be prescribed, and therefore the most flexible time period which the Army can use.

In addition to the Army need for a flexible program from the standpoint of variations in curriculums, there is an even greater Army need with respect to starting dates of the various specialized training programs. To be specific, some colleges will be asked to initiate programs on March 1, others on April 1, still others on May 1, and so on. Only in this way can men be assigned to colleges for Army specialized training as they become available through replacement training centers and induction centers. The alternative is the loss of valuable men who should be working under this program, but who, if they cannot be assigned promptly to an institution, are assigned to troop duty or overseas service. This does not mean, of course, that any one institution will be expected to take new units for training more frequently than quarterly, although some institutions have already demonstrated the practicability of taking more frequent assignments of soldiers.

The twelve week terms are combined into a basic program and a series of advanced programs.

The basic program consists of three twelve week terms, or a total of approximately nine calendar months. For the most part, all men entering at the basic level will undergo the same instruction during the first of the basic terms. In the second and third terms, variations begin to occur, depending on the interests and abilities of the respective men. A typical curriculum will require about two thirds of the contact academic hours in mathematics, physics, chemistry and other sciences, and the remaining one third will be devoted to history, English and geography.

Men who qualify for advanced work will at the conclusion of the basic program be routed into specialized fields.

Here again the work is in twelve week terms, but the number of such terms is dependent on the field in which the soldier is working and varies accordingly.

The problems involved in selecting the institutions which will provide this academic training are most important, and a joint board consisting of three representatives of the Army, three of the Navy and three of the War Manpower Commission is working on them. The board's problems are to determine the best possible use of educational facilities and to minimize overlapping and overconcentration in any one institution or in any one area. Wherever possible, only one of the services will be located at an institution, in order to avoid administrative difficulties. We do not know at this time how many institutions will be used, but we do expect to start with the best institutions in each field and work outward from that nucleus, with due consideration to geographic questions.

How, then, does this program differ in the case of medicine?

The premedical program runs five terms, or sixty-four weeks of elapsed time, as compared with the three term basic technical program. The curriculum calls for the following work, which has been translated into semester hours: mathematics, 8; physics, 8; chemistry, 18; zoology, 12; history, English and geography, 15, and other selected subjects, such as languages, sociology and psychology, 25. This is a total of 86 semester hours.

Premedical students will be housed in the same manner as other soldiers in the basic training program, will be subject to the same discipline and will undergo the same amount of military training and physical conditioning.

The medical program calls for the same number of semesters of work as medical standards now require. The compression here is one of eliminating long vacations and limiting furlough time to about four weeks in each calendar year.

Medical curriculums are unchanged. Each school will continue to establish its own curriculums.

Medical men assigned to this program will be selected in about the same manner as medical students have been selected all along—from the premedical group. School authorities will be requested to do the selection job under the general supervision of the Army, as these men are, after all, soldiers.

Military training will be reduced to one hour a week, and physical conditioning will be left largely to the men to work out for themselves. Wherever possible, the men will be housed and messed similarly to other men assigned to the Army specialized training program. When this is not possible, commutation allowances will be granted and the men will make their own arrangements for board and room.

It is planned that on graduation men will be commissioned as first lieutenants and then placed on inactive status so that they may complete a year of internship or residency.

One of the most important questions is obviously the one of selection of men. Where are they coming from? How will they be selected and assigned?

Let us assume that we shall be able to meet the problems of the transition period in a satisfactory manner and confine the discussion at this time to the long range picture, beginning with a young man graduating from high school and being inducted in the Army shortly after his eighteenth birthday.

While this soldier is undergoing his basic military training he will be under close observation by his superiors and in addition will be given tests to indicate his capacities and potentialities. These tests will be devised according to customary testing practices, which, of course, involve aid and assistance from people of such specialized fields as medicine.

Military training records, academic records and testing scores of all men who attain a score of 110 or higher on the Army general classification test will be coordinated by screening and selection boards. These boards will review the various records and, after a personal interview with each candidate, will recommend appropriate action. Men of sufficient maturity who meet all other qualifications will be directed to officer candidate schools. Those who are potentially good officer material but who need maturity and those who also need further academic training will be assigned to the Army specialized training program.

Throughout the program there will be constant screening of all soldiers working under it. Screening boards will be established at each institution where an Army specialized training unit is located, and at the end of each term men who are qualified will be continued in the next highest level of the program until their work has been completed. At that time they will be recommended to officer candidate schools.

Some men will be qualified for officer candidate schools at the conclusion of the basic program. Some men, unfortunately, will fail to attain required minimum standards and will be returned to troop duty. Some men will qualify academically but will fail to meet other Army standards. They will be returned to troops as enlisted men.

It is obvious that we shall need not only counsel but active assistance from members of the medical profession in all screening and selection processes of the medical program. We also need the help of your profession in the screening and selection processes in the other phases of the Army specialized training program. Some physicians will be asked to become members of the selection and screening boards at replacement training centers and others will have the same request made with respect to units at specific institutions. The Army knows what it needs, and among those needs are the wholehearted support and assistance of the members of the medical profession throughout. This we know we shall receive.

I earlier touched on the point that education is a continuous process, and in these few minutes I have tried to start your education with respect to the Army specialized training program. Now you must educate us so that the medical profession and the Army can together fill the Army's medical needs.

MEDICAL EDUCATION AND THE PROCUREMENT AND ASSIGNMENT SERVICE

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The Procurement and Assignment Service, which might now be called the medical division of the War Manpower Commission, is the agency of the federal government responsible during the war for the allocation of physicians, dentists and veterinarians to meet the needs of both the armed forces and the civilian population. Obviously, one of the major concerns of such an agency must be with the medical, dental and veterinary schools, which serve as the only source of supply for additions to and replacements within these professions.

The importance of maintaining and, if possible, of increasing the supply of physicians was recognized at the beginning of the program of national mobilization and military training. The medical schools responded promptly to this need by recommending through their national association that the graduation of physicians be accelerated by the discontinuance of vacations and that medical schools increase their enrolments as much as their facilities would permit without prejudice to the quality of medical education. Recently, they have gone still further in shortening the over-all period of medical training by recommending that medical schools reduce their requirements for admission from three or four years to two years of premedical college work.

MAINTENANCE OF ADEQUATE TEACHING FACILITIES

Since our involvement in the war, medical schools have released many of their faculty members for service, in many instances highly specialized service, with the armed forces. At the same time, they have assigned other members of their staffs to work on war research. The medical schools have done all this promptly and willingly, in spite of the fact that they are faced with their heaviest teaching responsibilities in history.

The concern of the Procurement and Assignment Service with this recruitment from medical faculties is to assure the retention of adequate teaching staffs for the conduct of a sound program of medical education during the war. To accomplish this, each medical school has been requested periodically to appraise its teaching faculty, marking as "available" those members who could be released for service with the armed forces but listing as "essential" those who constitute the minimum staff necessary to conduct a sound teaching program.

Analysis of the medical school lists of "essential teachers" for the current academic year shows that, to July 1, 1942, 21 per cent of the physicians on medical school faculties were in Army or Navy service, as compared with 12 per cent of all physicians in the United States. In addition, the medical schools listed as "available" 25 per cent of the physicians of military age remaining on their staffs.

Some schools appear to have been overly zealous in releasing members of their faculties and to have retained insufficient staffs for the instruction of their students. The result can only be a sacrifice in the quality of the training of the medical students in these institutions.

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Other schools have been more conservative and should be able to release additional physicians in 1943 toward meeting the quotas of medical officers needed for service with the armed forces.

Occasionally one hears the opinion expressed that medical teaching during the war might be done by practitioners who are over military age or are physically disqualified for military service. Such suggestions reveal a failure to realize that medical teaching has become very much of a specialty and that in many schools younger men not only carry most of the teaching load but are the most effective teachers. Before the war considerably more than half of the physicians teaching in medical schools were under 45, and on the average these men were devoting more time to teaching than were their older colleagues. Furthermore, most practitioners are too busy these days to assume much, if any, more teaching responsibilities. It is essential, therefore, that some of the effective younger teachers who are devoting all or a large part of their time to teaching be retained on the faculties of the medical schools. It is here that they can render their most valuable war service.

The lists of "essential teachers" as submitted by the medical schools are reviewed by the Medical Education Committee and the Allocations Committee of the Procurement and Assignment Service. The opinions of these committees in regard to the lists are then transmitted to the chairmen of the respective state committees of the Procurement and Assignment Service, who are responsible for making decisions as to availability or essentiality of the individual physicians in their states. Appeals from the decisions of state committees may be made by the dean of the school or by the physician concerned to the corps area committee or even to the Directing Board of the Procurement and Assignment Service. As already stated, the objective of this service is to retain adequate teaching staffs for the medical schools, but to do so without withholding from military service more than a minimum number of men who are physically qualified for such service.

MEDICAL STUDENTS

An adequate and uninterrupted supply of qualified medical students is obviously necessary if there is to be a continuing output of competent physicians from the medical schools. The procedures which have been followed up to the present time to enable medical and premedical students to continue their training are too familiar to need review. However, the lowering of the draft age to 18 years and the proposal of the Army and Navy to place selected medical and premedical students on active duty to continue their medical education have introduced new problems.

Dr. Edward C. Elliott and Brig. Gen. Joe N. Dalton have outlined the general plans for the proposed Army-Navy specialized training program. As citizens, taxpayers, parents and educators, we are interested in this entire program, but it is the medical aspects of it which concern us most deeply. The Directing Board of the Procurement and Assignment Service has questioned the advisability and the necessity of this program for medical students but, since it appears that they are to be included, there is nothing to be gained by further debating the point.

As the program is planned, some medical students will be on active duty in the Army and some in the Navy, and some, including the women and those who are physically disqualified for military service, will continue as civilians on their own financial resources.

In order that there may be places for these students in medical schools after the Army-Navy specialized training program is operative, the Procurement and Assignment Service has recommended that 20 per cent of the places in medical school classes be reserved for students who are not included in the proposed Army-Navy programs. It has recommended also that, after the armed forces have secured their necessary replacements from the medical school graduates, the additional physically fit men in this group be commissioned and assigned to replace older men now in the service, who could then be released from active duty to return to the care of the civilian population.

It is from this group, together with the women and those physically disqualified for military service, that physicians to fill essential positions in civilian life, including war industries, will have to come. However, students who are not subject to military service and are paying for their own education are free agents to practice where they will. Possibly the creation of a War Manpower Commission Corps which would include these students and obligate them to accept assignments to practice where needed during the war would be worthy of consideration.

The plan provides that the medical course proper will be continued on an accelerated basis without change except for the addition of a few hours a week of military instruction.

The proposal concerning the premedical course is more disturbing. For a number of years, all but a small percentage of medical students have had three or four years of premedical training. Several months ago, the deans of medical colleges at their annual meeting voted to recommend that for the duration of the war all schools reduce their entrance requirements to two years of college work. The resolution embodying this recommendation stated, however, that "it is the judgment of the Association of American Medical Colleges that students cannot be prepared adequately to meet the modern requirements of medical education with less than this minimum preparation."

In spite of this, it is proposed that the premedical training under the Army specialized training program be limited to five terms of twelve weeks each. This is less than two college years. I sincerely hope that this will be adjusted to provide at least the two years of premedical education which is the minimum that has been required by the medical schools for almost half a century and is also the minimum required by many states for medical licensure. Even though the courses prerequisite for the study of medicine can be crowded into a shorter period, the students will be lacking in the intellectual maturity, the broader educational background and the judgment so important for this study.

A compensating element in this program is the fact that for a large proportion of students accepted by medical schools there will doubtless be an interval of three to six months between the time of their completion of the prescribed five terms of premedical work and their actual admission to medical school. It is probable that the students who have enlisted in the Army will be assigned during this interval for basic military training or for service in an Army general hospital. Either service will provide valuable experience as well as a desirable short respite from their studies before they embark on the accelerated medical course.

There are many details and questions concerning this program which have not yet been worked out, or to which the solutions are not yet available. In early December, when these training programs were first announced, there was still the important question as to how desirable and qualified premedical students could be kept in school instead of being inducted by the Selective Service System before the proposed specialized training program could be established. The Directing Board of the Procurement and Assignment Service recommended to the War Manpower Commission that Selective Service direct the deferment of premedical students in good standing until the proposed specialized training program becomes operative. This order was contained in Selective Service Bulletin 41, dated Dec. 14, 1942, which authorized deferment until June 1943 for premedical students who have had one or more years of college work. It has been recommended also that Selective Service provide for the deferment of any student accepted for admission to an approved medical school, provided such deferment does not exceed two years. On this recommendation national headquarters has as yet made no release.

In addition, the Adjutant General has ordered that premedical students who are inducted by Selective Service be assigned back to college to continue their training on an inactive status until the end of the term or semester.

On several occasions, the situation of premedical students and their selection for assignment to the proposed specialized training program was considered in joint conference by the Directing Board of the Procurement and Assignment Service with representatives of the Surgeon General of the Army, of the Surgeon General of the Navy and of the Selective Service System, and, as a result of these conferences, the Directing Board of the Procurement and Assignment Service recommended that accredited medical, dental and veterinary medical schools give consideration to the early acceptance of qualified premedical, predental and preveterinary students for the classes of the calendar year 1944 as well as 1943.

This recommendation stated that students so accepted should be clearly qualified and desirable for training in these professional fields. After acceptance, students who are not in an Army or Navy reserve corps should be recommended for deferment to their Selective Service boards, and these recommendations carried to appeal boards if necessary. Such deferments should be only for the limited period until the proposed specialized training program becomes operative. Vacancies in these classes after the advance selections should be filled at a later date.

At a subsequent meeting, the following supplement was added to this recommendation:

> That medical schools proceed with the selection of clearly qualified students for the classes of 1944, but that this be done with the definite understanding that these acceptances are tentative and subject to the approval of the Army or the Navy for those students who may be assigned for training in conformity with contracts which may be entered into between these services and the respective schools.

Students who are accepted for medical schools in accordance with these recommendations will be in a favorable position for deferment by Selective Service irrespective of their year in college. And indication by the medical schools that certain students are acceptable for admission will provide helpful information to the Army and Navy boards which will be responsible for selecting students to continue their premedical training in the proposed specialized training program. In this manner, the medical schools will be rendering a valuable assistance in the selection of premedical students for the Army-Navy training programs and will have a voice in the selection of their classes for 1944.

Once the proposed Army-Navy specialized training program becomes operative, advance selections will no longer be necessary. In fact, final selection could then be well postponed until the last quarter or semester of the premedical program. The recommendation for advance selection of outstanding students is to safeguard the supply of qualified premedical students during this transition period.

INTERNS AND RESIDENTS

The Procurement and Assignment Service is concerned with hospital internships and residencies both because the internship is an important part of medical training and because certain resident physicians are essential for the clinical instruction of medical students and for the proper care of patients in certain hospitals. With hospital residents, as with the faculty of medical schools, the problem is to release as many as possible for service with the armed forces and still retain the minimum number essential for the proper functioning of the institution. Concerning interns and residents for 1943, the Directing Board of the Procurement and Assignment Service has issued the following statement:

Interns.—Graduates of medical schools who hold commissions in the Army or Navy will be allowed twelve months' deferment of active duty for the completion of an internship. This makes it necessary that internships begin immediately on graduation. Medical school graduates who are deferred by Selective Service may, under the Selective Service regulations, have their deferments continued through one year of internship. Medical school graduates who on account of sex, physical defects or other causes are not subject to induction or likely to be reclassified by Selective Service are not officially restricted as to the length of internships which they may serve but they too have a responsibility to make themselves available as early as possible for civilian services which contribute to the war effort.

Residents and Fellows.—Interns who have already had a year of hospital service must be considered as residents for the duration of the war. Although the Army and Navy appreciates the importance of graduate training in the various specialties of medical practice, they do not feel that they can at the present time defer calling interns to active duty in order that they may continue specialized training in civilian hospitals. Therefore, the only justification for the continuation of residencies and fellowships during the war is that they are essential for the provision of adequate medical care for the hospital patients or for the clinical training of medical students. In view of this situation, there are several principles that must be followed in the selection of hospital residents or clinical fellows for 1943:

First, the minimum number of residencies with which each hospital can function must be determined. For 1942 the Directing Board of the Procurement and Assignment Service stated that in general this number should be less than 50 per cent of the number of residents that these hospitals had before the war. For 1943 this number must be reduced still more.

Second, having determined the minimum number of residents that are essential, these should be selected from the following groups in order:

1. Physicians who for physical or other reasons cannot qualify for service with the Army or the Navy.

2. Present interns or residents who are deferred by Selective Service. Preference in this group should be given to those who have been deferred in class IV-F and class III-A or III-B and maintain a bona fide family relationship with wife and/or children.

3. Present interns who hold commissions in the Army or Navy. No requests for deferment of individuals in this group should be made until the possibilities of filling minimum essential residencies from individuals in groups 1 and 2 have been exhausted. It is impossible at the present time to give assurance that interns who hold commissions will be deferred. The Surgeon General of the Army and the Surgeon General of the Navy have assured the Procurement and Assignment Service of all possible cooperation in meeting this situation. On the other hand, the urgent need for medical officers in this age group and the necessity of securing the authorization of the War and Navy departments to hold men with commissions in an inactive status beyond one year of internship make it imperative that hospitals make every possible effort to fill essential residencies and fellowships without depending on interns who hold commissions or those who might be subject to induction by Selective Service.

On January 28, in response to the joint request of the Procurement and Assignment Service and the Surgeon General of the Army, the Secretary of War sent the following memorandum to the chairman of the War Manpower Commission:

I agree with you as to the desirability of maintaining essential residencies in civilian hospitals, and securing consent to deferment, for not to exceed an additional twelve months, of certain essential physicians who are already commissioned in the Army, subject to the following: (*a*) Each request for deferment will be handled as an individual case. (*b*) The residency for which the officer concerned is desired must be declared by the Procurement and Assignment Service for Physicians, Dentists and Veterinarians as being essential. (*c*) Each request for deferment will include a certificate from the authorities of the hospital concerned to the effect that effort has been made to obtain a physician who has not been obligated for the military service.

The Surgeon General of the Navy has authority to grant similar deferment of active duty to interns who hold commissions in the Navy.

In view of this authorization, superintendents of teaching and of large charity hospitals which are accredited for residency training may present to the chairman of their respective Procurement and Assignment Service state committees requests for the postponement of active duty for a limited number of interns or residents who hold commissions in accordance with the conditions stated.

Each such request will be considered as a special case by the Surgeon General. Action will be based on the certification by the hospital superintendent as to the essentiality of the position and the impossibility of filling it with a resident who does not hold a commission in the Army or Navy, and on the recommendations of the state and corps area chairmen and the central office of the Procurement and Assignment Service. No definite figure has been set for the number of such deferments, but it is essential that requests be limited to situations which are truly critical and which cannot be filled by physicians who have not been commissioned in the armed forces.

CONCLUSION

I want to assure you that the Directing Board of the Procurement and Assignment Service is deeply appreciative of the invaluable contribution that the medical schools of the country are making to the war effort and to pledge the cooperation of Procurement and Assignment Service to the medical schools in their efforts to maintain an effective program of medical education during the war.

MEDICINE AND THE WAR

COLONEL GEORGE F. LULL
MEDICAL CORPS, UNITED STATES ARMY

A year has passed since the last meeting here in Chicago, and many changes have occurred. In December 1941 the personnel in the Medical Department of the Army consisted of 11,384 in the Medical Corps, 3,117 in the Dental Corps, 700 in the Veterinary Corps, 226 in the Sanitary Corps and 1,441 in the Medical Administrative Corps. Those were dark days. The Army was being built up rapidly, and the Medical Department was not keeping up. In fact, in May of last year we were under strength 7,000 Medical Corps officers.

Early in the spring it was realized that something had to be done in order to secure medical officers. Precedence was broken, recruiting boards were set up in each state and physicians were actually commissioned on the spot. Conditions started to improve in June, and when 1942 came to a close we had 35,594 medical officers on duty, only a little more than 3,000 under our total requirements. Dental and veterinary requirements had been met, the Sanitary Corps was still somewhat undermanned and the Medical Administrative Corps, although below strength, was being augmented at the rate of as high as 1,250 a month. At the present time about 900 Medical Administrative Corps officers are being commissioned from officer candidate schools each month.

The Army continues to grow, and an adequate medical service must be provided. This will take more medical officers, but due regard must be given to the home front, and the civil population must receive adequate medical care.

The American soldier at present is receiving the highest type of medical care. Hospital commanders who visit the Office of the Surgeon General usually tell me what a fine staff they have and thank me for showing them the special favor of selecting men of such high type for their commands. When six or seven say the same thing in a few days, one realizes that the cross section of personnel supplied must be good, but, of course, credit is taken for showing personal interest in the particular unit.

Since the last meeting many men have gone overseas, both toward the east and toward the west, and medical personnel in adequate numbers have accompanied all troops. Some of this personnel have gone to places where there has been great activity, and others have accompanied troops to places where there has been no action. Only a short time ago I received a letter from the wife of a medical officer in which she criticized the Surgeon General for the treatment shown her husband. She said that he had been sent to a small island in the Pacific where there had been no fighting to date, that it was a shame he had to stay there and take care of a lot of healthy soldiers and that he was losing his surgical technic. Should this island be attacked, however, a man who knows surgical technic will be sorely needed, and some one must be on hand to take care of the casualties as soon after they occur as possible.

Young medical officers entering the service object to being assigned to tactical units and think that anything they learn that is not purely medical is a sheer waste of

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time. The medical officer with a tactical unit is first, last and always a physician. He has to learn a little about a lot of strange subjects. He is, first of all, the family physician to his unit. He must be expert in first aid, have a well rounded knowledge of sanitation and preventive medicine and know emergency surgery. In order to keep as many men on the firing line as possible, he must exercise excellent judgment in the selection of patients for hospitalization. He must recognize infectious diseases early in order to prevent their spread. He is the most important link in the chain along which the wounded soldier travels.

A recent article written by an American physician with the British said, relative to the qualifications of a medical officer in the forward area:

> He should know the design and fitting to vehicles of water tanks; navigation by map and compass; how to light a primus stove in the wind; what to do if the lights fail in an operating tent; how to keep sick men warm in cool weather; what to do and say if the gasoli.e tank is filled with water; the technic to be adopted if, when operating, the enemy pays an unexpected visit; how to get out of a mine field into which you have unsuspectingly areaed, etc.

The action in the present war is different from that in all previous wars in that it is more fluid; that is, the movement is faster and changes take place with lightning rapidity. The writer quoted stated that the first knowledge of the enemy's presence may be the explosion of an antitank shell. The movement of dressing stations and other installations must be accomplished in a few minutes. In the last war the patient was taken back to the doctor, but now the doctor has to be taken to his patient. It is the patient who receives adequate, early treatment who gets well. The man who gets back to a general hospital in the rear usually lives.

There have been developments since the last war which have saved hundreds of lives. Among these are the sulfonamide compounds, the utilization of blood plasma and tetanus toxoid immunization. Bullets and high explosive shells continue to kill and maim, and, although technics of treatment change, the fundamental principles remain the same. One of these principles I will repeat, and that is to give the wounded man the proper treatment as soon as possible after he is wounded.

The proper employment of specialists is a question that comes up at any meeting and is probably of more interest to this group than to most. Not all medical specialists are being employed in their specialties, I know. However, a great deal of conscientious effort has been given to seeing that they are placed where the government will get the greatest good out of their services.

The secretary of one of the specialty boards recently wrote me that forty-two men in Army uniform appeared at the last examination. Each man was questioned about his duties, and all but two were working in the special field he was being examined in. Remember that one of the criteria in classification of specialists is certification by the board, and none of these men had been certified at the time of their assignment.

The Surgeon General welcomes information from the boards and from the colleges as to men who seem to be improperly cast in the present conflict. Be sure of your information, however, as sometimes we receive word which, on investigation, is not entirely correct. This fact was brought home to me recently when I ordered an officer's station changed at the suggestion of an outstanding American specialist. When the order was issued the specialist called me on the telephone and said that the officer had found out it was at his suggestion and soundly berated him for his interference, saying that whoever had told about his being misused was not familiar with the true facts in the case. Fortunately, I was able to revoke the order by spending nearly an hour making long distance telephone calls.

Certain types of specialists are present in greater numbers in the Army than others. The percentages closely parallel those in civil life, as shown by a comparison with statistics of the American Medical Association. For this reason it is much easier to assign some specialists than others. The rosters received from various stations are constantly being checked to find qualified men as these men are needed for new units.

Since the last war the relative number of specialists has greatly increased, and through the American boards and other agencies we are able to evaluate them. That is, if the officer is certified we take it for granted that he is qualified in his field. If he is not certified but is qualified, it is much more difficult to evaluate him.

There is another matter concerning which justifiable complaint has been heard, and that is the formation of hospital units which have been kept on a training status for long periods and not used functionally. In a war of the present type, this is bound to happen. Units are assembled for shipment to certain theaters, and the tactical situation changes so that they are not sent. Priorities in the matter of shipping also have part in controlling this matter. The officers assigned to these units can be trained in a relatively short period, while the training of the enlisted men takes much longer. We are now attempting to utilize in a professional capacity all medical officers of numbered hospital units at stations not too far distant from the unit's assembly point and leave only a small overhead with the unit to train and administer it. We feel that it is not proper to withdraw from civil life physicians whose services cannot be utilized, except that we must have a reserve pool from which we can draw officers not only for original assignment but for loss replacements. The civilian physician cannot start to function as a medical officer the day he puts on a uniform. Though he is well qualified as a physician, there are many things for him to learn of an administrative nature, especially if he is to be the head of a service or section in a hospital or if he is to be assigned to a tactical unit.

In the first week of 1943 we changed the course at the Medical Field Service School from one month to six weeks. A new class enters every two weeks and continues until the course is completed. This means that three classes are conducted at the same time and the graduates are available for assignment every two weeks. It is highly advantageous to the individual as well as to the service for him to take this course as soon as he is commissioned. Unfortunately, it will be impossible to send all newly commissioned officers, as we have such a large backlog of officers already on duty who have not had the course.

There are at present fifteen courses in various professional subjects being given at civil institutions. These courses last for varying periods, but most of them are of three or four months' duration. They are popular, but many deserving officers have not been sent to them because they could not be spared from their present duties. They will be available for later courses. These courses are not intended to make specialists out of the officers but are in the nature of special instruction along lines which will improve the officer who already has some background for the particular type of work.

There is a demand for a certain number of women physicians for duty with the Women's Auxiliary Army Corps. Such physicians are hired as contract surgeons and sent to the WAAC training center at Fort Des Moines, Iowa. After a period of training they are given commissions in the WAAC. Apparently few women desire this type of work, as less than a dozen qualified physicians have applied, although publicity has been widely distributed.

As medical educators, you are no doubt interested in the status of the resident physician. At a recent meeting with the Procurement and Assignment Service, it was estimated that next year there would be needed 2,800 residents in various institutions. This is a pronounced reduction from the present number. They will be chosen primarily from the following groups: (1) women physicians, (2) men physicians who are physically disqualified for military or naval service, (3) men physicians who do not hold commissions but are in class 3A, (4) alien physicians and (5) in limited numbers physicians who hold commissions but who may be deferred for an additional year before entering the service. The first four groups should be sufficient to furnish most of the needs.

Last month's data as to the status of residents were obtained by the American Medical Association from various hospitals. There were 648 replies received from 780 questionnaires, with the following figures revealed: total residents, 3,872; those with Army, Navy or Public Health commissions, 273;[1] those who have applied for commissions, 332, and those without military or naval status, 3,267. Of these, 707 have been rejected physically and 472 are women. There remains available if physically qualified 2,088.

If we are to defer men who already have commissions, we will have to get some of the 2,088, and we have no claim to any of them.

Brig. Gen. Joseph N. Dalton spoke about the Army's specialized training program. Arrangements have been made to have a representative of the Surgeon General assigned to Col. Herman Beukema's office to handle the problems of premedical and medical education. This program, as far as we can see, will make some radical changes in premedical education but will interfere little with medical education as it is practiced at present. Every one hopes that the war will be brought to a successful termination before the program has had a chance to run for many years.

When you hear from a disgruntled officer please evaluate his statements before you form an opinion of the entire medical service of the Army. Remember that there are 35,000 physicians in the Army, all of whom are looking forward to one thing only, the successful termination of the war. Many are doing things they do not want to do, but these things must be done. Also remember that there are a lot of medical officers satisfied with their temporary jobs, and most of these do not write to you.

In this brief statement I have touched on a few of the important problems facing us at this time. There are many more I have failed to mention. The solution to many of these problems has been and will be in your hands. You have been so willing to cooperate with us in the past that I feel the future is assured and we may be proud of American medicine's part in this gigantic struggle.

1. A sample of one hundred of those who claim army commissions shows only forty-three actually commissioned.

OBSERVATIONS ON THE PREVENTION AND MANAGEMENT OF PEPTIC ULCER

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When one approaches the problem of peptic ulcer one is confronted with a bewildering mass of data concerning its pathogenesis, diagnosis and treatment. Since preventive and effective treatment depends on a knowledge of the cause of ulcer, it is of interest to consider at once the factors apparently involved in its incidence and its production.

INCIDENCE IN MILITARY AND CIVILIAN POPULATIONS

From many quarters today come reports of the increasing incidence of peptic ulcer since the beginning of the war.[1] This is true in European countries as well as in America, especially in the military forces. Whether ulcer is actually affecting an increasing number of persons or whether it is being recognized in persons not previously suspected of having it will depend on a critical analysis of the situation after the war is over. It has been suggested that the large scale physical examination of draftees has brought to light an unsuspected prevalence of ulcer and that most of the men in the Army found to have ulcer had it before admission. In Germany an increase in the incidence of peptic ulcer is said to have been progressive since the World War; the increase is attributed in part to improved methods of diagnosis and especially the more extensive use of x-ray examinations. In many instances it has been obvious that ulcer symptoms appearing after admission to military service have been due to activation of old ulcers from the added stress and strain of army life. In this connection, however, there is scarcely a single factor mentioned as a possible cause of ulcer or ulcer aggravation that cannot be refuted by contradictory findings. For instance, in the British army[1] overexertion and army rations are emphasized, while in the British navy[2] the rations and the steady diminution of active manual work as a result of the increasing number of mechanized and motorized units is held at fault. In many reports lack of proper nourishment is stressed, while in others ravenous overeating after heavy exercise is considered responsible. In the civilian population attention may have been drawn more frequently to the presence of ulcer because people at large have been rendered stomach conscious by increasingly high pressure salesmanship via press and radio for all kinds of remedies, diet fads, alkalization and vitamin essentials.

Both in the military and civilian populations, duodenal ulcer has shown an apparently greater increase

Read before the Section on Practice of Medicine at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1942.

1. Payne, R. T., and Newman, Charles: Interim Report on Dyspepsia in the Army, Brit. M. J. **2**: 819 (Dec. 14) 1940. Graham, J. G., and Kerr, J. D. O.: Digestive Diseases in the Forces, ibid. **1**: 473 (March 29) 1941. Rothe, H.: Zunahme der Magen- und Zwölffingerdarmgeschwüre im Kriege? Deutsche med. Wchnschr. **67**: 810 (July 25) 1941. Tidy, H. L.; Newman, C. E.; Scadding, J. G.; Hurst, Arthur; Hartfall, S. J., and Payne, R. T.: Dyspepsia in the Forces, Brit. M. J. **1**: 529 (April 5) 1941. Hurst, Arthur: Digestive Diseases in Soldiers, Am. J. Digest. Dis. **8**: 321 (Sept.) 1941; Incidence of Peptic Ulcer, Brit. M. J. **1**: 530 (April 5) 1941. Brockbank, William: The Dyspeptic Soldier, Lancet **1**: 39 (Jan. 10) 1942.

2. Allison, R. S., and Thomas, A. R.: Peptic Ulcer in the Royal Navy; Symptoms and Pathology, Lancet **1**: 565 (May 3) 1941. Allison, R. S.: Peptic Ulcer in the Royal Navy: Etiology, ibid. **1**: 596 (May 10) 1941.

than gastric ulcer and, as might be suspected, chiefly in males. In connection with these observations it is of the utmost importance to determine exactly on what basis they are made. Certainly the diagnosis of ulcer cannot be made on the history alone, though this is most important, and indirect x-ray evidence is not reliable. Therefore it is required that the diagnosis should not be made unless positive x-ray evidence of the ulcer accompanies a positive history, or proof of the lesion is secured at operation or autopsy. If one would accept only positive x-ray evidence secured under the most favorable conditions and only by skilled observers, duodenal ulcer would not appear to be on the increase in the civilian population, judging from the experience of E. P. Pendergrass. He reports in a personal communication that, in 1940, 1,000 cases of stomach and duodenum were studied in the University of Pennsylvania Hospital. In this series 19 cases of gastric ulcer were found and 94 cases of duodenal ulcer. In 1941, 1,343 cases were studied in which 27 cases of gastric ulcer were found and 92 cases of duodenal ulcer. Actually, in these studies, there was no change in the number of cases of gastric ulcer but there were 2.4 per cent less cases of duodenal ulcer. The statistics of the first world war show that gastric ulcer was diagnosed in the United States forces almost three times more frequently than duodenal ulcer; at the present time in civilian and military groups approximately the same ratio, but exactly reversed, is being reported. Definite reasons for this should be available and I believe will be when this subject is more critically investigated. One of the reasons, for instance, for the present figures may be that duodenal ulcer makes itself more often clinically manifest than gastric ulcer. This is suggested by Madelung,[3] who showed in a study of 10,000 autopsies that, in 17.8 per cent of cases, ulcers or scars of ulcers were found; of these, 70 per cent were in the stomach and only 30 per cent in the duodenum.

A number of factors having a common influence in the military and the civilian population have been mentioned as predisposing causes of the increase in ulcer. Among these is the part played by anxiety, grief and worry over loved ones, which is, of course, equal in military and civilian groups. Another is the disruption of the usual routine of life, which has been reported as much in civilians by defense industries and activities as among the soldiers by military activities. Irregularity and haste in eating, rather than the quality of food, are properly condemned, especially in the urban groups, who, incidentally are affected more by ulcer than those in the country. Seasonal peaks in ulcer incidence have been attributed to lower vitamin intake and increased respiratory tract infections.[4] Not long ago Alsted,[5] in a thorough study of the increase in ulcer in Denmark, concluded that no one factor could be held responsible, as in all probability the constant and continuous changes in social and living conditions are all involved. According to Alsted, the incidence of dyspepsia has increased with the increased tempo of life. He comments somewhat sadly that, in spite of advances in the social sciences, there is less security today than in the past. He believes the definite improvement in dietetics has been largely offset by the adoption of all kinds of fads and that our primitive instinct for selection of food has been lost and we are at the mercy of the sometimes brilliant but occasionally erratic and misleading conclusions of the human mind.

After all is said and done, it must be admitted that only time and a carefully balanced analysis of all the facts will provide the true story concerning ulcer in the armed forces. There would seem to be nothing unusual in the fact that a young man, probably of sedentary habits, who is suddenly transferred from civilian to military life, with the change of diet and habits that the latter requires, develops a type of dyspepsia that may simulate ulcer. Furthermore, much depends on the roentgenologist and the medical officer making the diagnosis of ulcer. The heightened interest of certain examiners and the impatient indifference of others when dealing with "dyspepsia" require on the part of those responsible great stability of judgment in evaluating the data on this subject. The number and variety of factors that can constitute a considerable source of error in diagnosis is so great that at the present time it would be well to withhold any convictions in the matter.

INCREASE IN CONSUMPTION OF TOBACCO

Perhaps the one factor in both military and civilian groups that is most consistently mentioned in association with ulcer, especially since the beginning of the war, is the increased incidence of smoking. Major Crampton[6] of the United States Army has recently emphasized that cigaret consumption was more than doubled in the United States during the first world war years 1916-1919, rising from 25 billion to 53 billion annually. The increase in consumption of tobacco in the Army in that period was nearly three times as great as in the general population, the result, as he says, of the increased tension of camp life and war consciousness. Crampton informs us that cigaret smoking has enormously increased since the last war, the consumption now being eight times as great as in 1916, and that there was a 12 per cent increase in cigaret consumption in the four months ended in April 1941 as compared with the corresponding months of 1940. The probable significance of this may be appreciated when one realizes that in 1930, as reported by Bastedo, 123 billion cigarets were manufactured, i. e. 1,500 a year for every American man, woman and child over 14 years of age. Emphasis is given to these exceedingly important observations on cigaret smoking because of the increasing suspicion of the relationship it bears to ulcer.

Ulcer develops notoriously more frequently in a certain type of individual—an autonomically unstable, excitable, energetic individual—one who appears to possess an ulcer diathesis, as it is called, by virtue either of heredity or of environment, but chiefly the former. It is true that different individuals may react differently to tobacco, and even different parts of the same individual may react differently than other parts. It is generally recognized, however, that "nicotine primarily and energetically affects the autonomic nervous system," and all candidates for ulcer have a susceptible autonomic nervous system.

Tobacco, furthermore, is admitted to affect the circulation, especially the vasomotor tone of the arteries,

3. Madelung, W.: Häufigkeit und Folgezustände von Magen- und Duodenalgeschwüren, Ztschr. f. klin. Med. **136**: 727, 1939.

4. Crohn, B. B., and Shwartzman, Gregory: Ulcer Recurrence Attributed to Upper Respiratory Tract Infection, Am. J. Digest. Dis. **4**: 705 (Jan.) 1938.

5. Alsted, Gunnar: Studies on the Changing Incidence of Peptic Ulcer of the Stomach and Duodenum, London, Oxford University Press. 1939.

6. Crampton, C. W.: The Cigarette, the Soldier and the Physician: Fundamental Factors of the Problem, Mil. Surgeon **89**: 1 (July) 1941.

veins and capillaries.[7] It is probable that through such a mechanism Mosinger and Bonifaci[8] produced both acute and chronic round ulcer in guinea pigs by the injection of nicotine. Recent investigations have demonstrated anew the importance of disturbances of the circulation, especially those of a functional nature, in the pathogenesis of ulcer.[9] Tobacco is recognized as a cause of hyperacidity. Rosenblum[10] has shown that cigaret smoking in the fasting state produces a significant increase in the free and total acidity of the gastric juice as well as a considerable increase in the volume of the juice in patients with duodenal ulcer. Schnedorf and Ivy,[11] as a result of their investigations, cautioned persons with ulcer against the undesirable effects of straining their tolerance to tobacco, their findings indicating that smoking might aid in producing ulcer or in aggravating existing ulcer. The effect of tobacco on secretion, in conjunction with its effect on the vascular system, justly places it under suspicion as a factor in the cause and chronicity of ulcer. In the German army the authorities are so convinced of the etiologic importance of smoking that efforts to regulate the habit have been made, punitive measures under some circumstances being enforced. An exhaustive treatise by Lickint[7] on the effect of tobacco on the human body has recently been published.

INFLUENCE OF CIRCULATORY CONDITIONS

Reference has been made to the influence of circulatory conditions as a cause of ulcer. No attempt will be made to discuss this theory of ulcer production in detail. The idea is not new. Virchow, of course, was the first to involve the vascular system in the cause of ulcer. He believed that ulcer resulted from thrombosis and embolism in the smaller gastric vessels. Since then a number of writers have maintained that disturbances of the blood supply to the stomach were of primary importance in the etiology of ulcer. Recent investigations demonstrate that an abnormal blood supply, especially the result of recurrent or persistent vasomotor spasm, may lead to impoverishment of the mucosa with ischemia, erosion and eventual ulceration. The work of Nedzel,[12] Berg,[13] Riggs and her collaborators,[14] Griffith and myself[9] supports such a contention, which is based particularly on the peculiar vascular characteristics of the vascular bed of the stomach and its rich vasomotor innervation, both of which predispose it to local deficiencies in blood supply. Some writers have mentioned the possibility of a disturbance of gastric nerve supply in the etiology of ulcer, a hypothesis postulated many years ago by Grote,[15] who believed that the actual pathologic factor was not the increased secretion of acid so much as an increased sensibility of the gastric nerves. The observations of Nothhaas[16] in respect to this are interesting, i. e. that not all the vasoneurotic suffer from ulcer, but all ulcer patients exhibit the typical capillary change of vasoneurosis, the latter being attributed to a constitutional deficiency of the vascular system.

CORROSIVE ACTION OF ACID

As a result of recent physiologic investigations the conclusion is reached that the corrosive action of the acid gastric juice and the proteolytic effect of pepsin are the major factors in the cause and persistence of ulcer.[17] That an impasse seems to have been reached concerning the role of acid is suggested by the fact that the acid corrosion theory of ulcer production is probably the oldest of all theories, and it should be obvious by now that the problem of pathogenesis is destined to make little further progress in this respect. It is encouraging, therefore, that thought is being given to the cause of the hypersecretion itself, especially whether it may be of central origin and dependent on neurogenic and psychogenic influences. Meyer and others[18] make the highly interesting comment with regard to acidity and ulcer "that hyperacidity in cases of duodenal ulcer is preceded by hypoacidity, and that hyperacidity may be caused by an unknown factor or by the ulcer, and not vice versa, as is generally believed." In Thompson's "Practical Medicine" published in 1903 it is stated that hyperacidity is the rule in ulcer and it is believed it may be caused by the ulcer!

Nothing seems to afford more promise of throwing light on this aspect of ulcer than the study of the influence of the midbrain. Recognition must be given to the position which psychosomatic medicine is assuming today, and in peptic ulcer, particularly, analysis along this line would appear to be reasonable and fruitful.[19] Intimation of the importance of the midbrain in the life cycle of ulcer is afforded by the pathologic studies of Boles and Riggs,[20] in which ulcer was shown to be associated with and presumably due to lesions of this structure.

In view of all the intriguing experimental study given to the pathogenesis of ulcer, especially by such brilliant students of the subject as Ivy, Mann and Dragstedt, it would be without reason to deny that acid plays an important part, but that it plays the primary and major role reflects an attitude that bears questioning. Adherence to such a doctrine explains, I believe, why the medical treatment of ulcer until a few years ago had not materially changed in twenty or more years and why the surgeons in the same period have completely reversed themselves concerning its surgical management. It was only a few years ago that Balfour,[21]

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13. Berg, Max: Experimental Studies on the Production of Peptic Ulcers by Vasomotor Alterations (Pitressin Episodes), Am. J. Digest. Dis. **7:** 78 (Feb.) 1940.

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15. Grote, cited by Rothe.[1]

16. Nothhaas, R.: Das Problem der Genese des Magen- und Duodenalgeschwüres, Klin. Wchnschr. **20:** 637 (June 21) 1941.

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20. Boles, R. S., and Riggs, Helena E.: Neurogenic Factors in Production of Acute Gastric Ulcer, J. A. M. A. **115:** 1771 (Nov. 23) 1940.

21. Balfour, D. C.: The Case Against Gastroenterostomy, J. A. M. A. **83:** 603 (Aug. 23) 1924.

truly a great surgeon, made the statement that "there is no operation more useful than gastroenterostomy in cases of duodenal ulcer, except in carefully selected cases. The operation in suitable cases can be depended on to give excellent and permanent results in more than 90 per cent of cases." In 1926 Moynihan, another brilliant surgeon, expressed the opinion that no operation in surgery had produced more striking or swifter results than gastroenterostomy. Today it is quite a different matter—only the carefully selected case is considered suitable for gastroenterostomy; and partial gastrectomy, which but a short time ago was violently opposed by the American surgeon, is being accepted with growing enthusiasm. In a recent editorial in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION [22] Wangensteen is reported as emphasizing that the most important criterion of an acceptable operation, speaking of duodenal ulcer, is that it reduce gastric acidity effectually, and that he feels that the three quarter resection meets these demands. The editorial goes on to say that the only known manner in which the secretion of acid may be diminished effectually is by sacrificing a liberal portion of the gastric mucosa. In the case of gastric ulcer, Walters is reported as saying that proper surgical treatment has been followed by excellent results and, in his experience, recurrence has not taken place when one-half the stomach has been removed. The operative risk of resection, according to the editorial, should not exceed 5 per cent, and in the hands of skilled surgeons should be less than that. While one greatly hesitates to question the opinion of the leading surgeons of today in this matter, it is but natural to compare their enthusiasm and conviction to that of equally capable surgeons of but a few years ago, who held directly opposite opinions, notwithstanding that in the meantime the objective they both sought, namely, a reduction in gastric acidity, is still shrouded in almost as much mystery as it was in the earlier days. Let it not be forgotten, furthermore, that peptic ulcer occurs in persons with a low acid secretion—that they heal in the presence of normal and increased degrees of acidity—and that they do not develop in many persons with decided hypersecretion.

MEDICAL AND SURGICAL TREATMENT

That the patient is fortunately getting the break in this startling reversal of opinion is a matter of comfort, as the better surgical minds agree that the uncomplicated duodenal ulcer is better left to the inventions of the internist. Even he in many cases, as well as the surgeon, is still doggedly determined to treat hyperacidity rather than ulcer, but despite this I am sure that all of us will agree that the use of any one of twenty-four substances so far recommended for gastric acidity, or the injunctions to go off on a hunting trip or the granting of a suppressed desire, has less potentiality for harm than the actual removal of three fourths of one's stomach.

Allen [23] states in a recent article that "duodenal ulcer is primarily a medical problem and that approximately 80 per cent of patients with this lesion respond to conservative measures." In the Lahey Clinic [24] only 8 per cent of 3,285 duodenal ulcers were submitted to surgery, whereas 23 per cent of 249 gastric ulcers were operated on. More gastric ulcers come to operation because of the greater hazard of cancer. In the Mayo Clinic [25] 60 per cent of gastric ulcers are treated surgically, obviously because of the fact that malignancy of such ulcers was found in 8 to 10 per cent of cases. Partial gastrectomy is the operation of choice because the chance of malignancy is greater than the chance of postoperative fatality, the chance of the former being approximately 10 per cent, while that of the latter was 3.9 per cent in 1940. In the case of gastric ulcer decision to operate should depend somewhat on the location of the lesion. The Mayo Clinic reports that malignancy was found in 10 per cent of lesser curvature ulcers, while 65 per cent of the prepyloric ulcers and all of the greater curvature ulcers were malignant. In older persons, the larger the ulcer, even on the lesser curvature, the greater the chance of malignancy. Great caution is necessary in any decision concerning malignancy because, as Eusterman has said, malignant gastric ulcer may successfully mimic a benign lesion, and Sara Jordan [26] advises us that "neither the size of the ulcer nor the age of the patient nor the presence of normal acid or hyperchlorhydria should lessen our suspicion of carcinoma. . . ." To me it has always been remarkable, in this matter of differential diagnosis between a benign and a malignant gastric lesion, how much dependence is placed on objective findings, particularly x-ray findings, and how little on the clinical subjective symptoms, which are infinitely less likely to lead one astray. In my experience a suspected or demonstrable lesion of the stomach in a middle aged or elderly person, with persistent anorexia, a low or absent acidity, a mild or increasing anemia and failing weight and strength is invariably malignant regardless of the x-ray interpretations. On the other hand a good appetite, a normal or increased acidity, a normal or especially a high hemoglobin and red cell count indicate that the lesion is benign. Of the subjective symptoms the one I have found that least often fails in differential diagnosis is the state of the appetite; a good appetite, though the patient may be afraid to eat, because of eventual discomfort, means a benign lesion. Persistent anorexia means malignancy, other things being suggestive.

IMPORTANT FACTORS IN PRODUCTION OF ULCER

The prevention and management of peptic ulcer, in view of the bewildering mass of data I have touched on and to which I have but briefly referred, would appear to be a despairing assignment were it not for the fact that certain ideas persistently emerge from the maze of theories surrounding the problem. I shall enumerate those that I believe are of importance in explaining the development of ulcer and on which effective treatment must be based:

1. Only a certain type of individual will produce an ulcer. It is a type with a suggestive physiologic, psychologic and anatomic pattern. It is probable that the pattern is fashioned by a certain qualitative type of autonomic nervous system.[27] As a rule, these indi-

22. Gastroduodenal Ulcer, editorial, J. A. M. A. **118:** 1452 (April 25) 1942.

23. Allen, A. W.: Surgical Treatment of Duodenal Ulcer, Arch. Surg. **44:** 501 (March) 1942.

24. Lahey, F. H.: Experiences with Gastrectomy, Total and Subtotal, in Surgical Practice of the Lahey Clinic, Boston, Massachusetts, Philadelphia, W. B. Saunders Company, 1941, p. 213.

25. Gray, H. K.; Walters, Waltman, and Priestley, J. T.: Report of Surgery of Stomach and Duodenum for 1940, Proc. Staff Meet., Mayo Clin. **16:** 721 (Nov. 12) 1941.

26. Jordan, Sara M.: The Problems of Peptic Ulcer, S. Clin. North America **21:** 665 (June) 1941.

27. Draper, George: The Emotional Component of the Ulcer Susceptible Constitution, Ann. Int. Med. **16:** 633 (April) 1942). Cannon, W. B.: The Influence of Emotional States on the Function of the Alimentary Canal, Am. J. M. Sc. **137:** 480, 1909. Necheles, Maskin, Meyer and Levitsky.[18]

viduals have energetic effective personalities and they live in a constant state of excitement, anxiety, fear or some other emotional ferment. In some, with little external evidence of instability, outward calm may hide inner chaos.

2. The peculiar quality of the autonomic nervous system referred to is susceptible to influences that favor ulcer production. These influences bring about alterations in the blood supply to the stomach and duodenum that diminish the vitality of the mucosa of these structures. Secondarily, the affected mucosa becomes subject to the corrosive action of acid gastric juice. Acid and pepsin are essential factors in the development of ulcer, but the mechanism of their production is imperfectly understood; certainly any attempt that is made to control their secretion should take into consideration the part played by the midbrain and various systemic disturbances.

3. Tobacco in an ulcer susceptible individual appears to be a consistent factor in the cause of ulcer and is of major influence in the prevention of healing and in the recurrence of the lesion.

4. Respiratory tract infections, such chronic infections as are found in the gallbladder and appendix, and gastritis apparently predispose to ulcer.

5. As far as eating habits are concerned, a greater risk of ulcer comes from hurried and intemperate eating rather than from the quality of the food eaten. Long intervals between meals and eating when fatigued, worried or angry are almost certain to invite ulcer. One would be surprised what can be eaten when in a happy frame of mind!

6. Anaphylaxis in certain individuals may explain ulcer production.

TREATMENT

In the prevention and medical management of ulcer, it is obvious that all persons, but especially the ulcer susceptible type, should avoid as far as possible the influences I have mentioned. Such persons should be advised to forego such destructive emotional extravagances as fear, anxiety, anger and ordinary perverseness. They should feel free to eat what agrees with them but avoid eating it when fatigued or in a bad state of mind. Generally speaking, alcohol and other irritants to the stomach should be used, if at all, in great moderation. They should restrict their use of tobacco to not more than six cigarets daily and should not smoke these on an empty stomach. They should rest after eating when possible and not subject their nervous system to the effects of too great application of the mind and too little manual activity.

I believe the complications of perforation and hemorrhage are largely preventable. They usually occur in persons who will not observe the general precautions I have outlined—who have overloaded their stomachs or have subjected themselves to unusual physical effort —or who have experienced some unusually severe psychic or emotional trauma. Justification for the latter statement is afforded by the important observations of Stewart and Winser [28] in England. They noted a statistically significant increase of perforated ulcers in the first two months of heavy air raids (September and October 1940) over the entire period for 1937-1940. The large majority (93 per cent) occurred in men, and mostly between 50 and 60 years of age. The same authors noted a considerable increase in deaths from peptic ulcer, the increase in the second year of the war being 28 per cent for men and 22 per cent for women.

Considering the precautions that must be observed to prevent a healed ulcer from breaking down it would seem highly inadvisable for the military authorities to accept any one for military service who has ever had a history of proved peptic ulcer or massive hemorrhage or to keep in military service any one in whom a peptic ulcer has been demonstrated by an experienced roentgenologist or at operation. If such individuals must be kept in service, provision for small frequent feedings should be made.

If an ulcer is so active that it is seriously interfering with the work and comfort of an individual, bed rest for two to three weeks is desirable. The diet must be adjusted to the circumstances, in any case being of a bland, palatable nature and taken in not less than six feedings daily in moderate quantities. In no case should it be too greatly restricted in variety or for too long a time. Psychologic as well as physical reasons dictate the necessity for this. The diet should be devised for the patient and not for the ulcer. Specifically a lack of vitamin C and protein content has been noted in ulcer cases, and in balancing the diet adequate provision should be made for these essentials.[14]

Of medicines, but few are required. Appropriate doses of bromides, phenobarbital, belladonna and one of the colloidal aluminum substances or the various alkaline antacids usually are all that are temporarily necessary to control pylorospasm and hyperacidity. In some cases nocturnal secretion must be controlled by means of an all night drip of milk or neutralizing solution. In other cases it is sufficient to awaken the patient once or twice during the night by means of an alarm clock to take some nourishment or an antacid. Sufficient evidence especially of an experimental nature has accumulated to justify consideration of urogastrone [29] and enterogastrone [30] in the treatment of ulcer, as they do depress secretion and inhibit motility. Needless to say, these are but the general principles of a medical regimen and modification of them would be necessary to suit individual cases.

Finally are the indications for surgery and the operation itself. The generally accepted indications for surgery are perforation, recurrent hemorrhages, especially in persons past middle life, obstruction that is not relieved within a short time by a medical regimen, inability to relieve acute symptoms and, in the case of gastric ulcer, any suspicion that malignancy may be present. In other words, complications, intractability or a suspicion of malignancy should afford the only grounds for operation.

Failure to relieve symptoms usually connotes an intractable ulcer. Before one advises operation, however, for a so-called intractable ulcer, it should be thoroughly understood that it is the ulcer and not the patient that is intractable. Poor results will follow in the latter case as surely as in the former. Intractability of a patient is not going to be corrected by any surgical operation yet devised to my knowledge, and, if persuasion or anything else can correct it, it were better to try it before rather than after operation. Lowering mortality records is all very good, but serious consideration must likewise

28. Stewart, D. N., and Winser, D. M.: Incidence of Perforated Peptic Ulcer, Lancet **1**: 259 (Feb. 28) 1942.

29. Gray, J. S.: Present Status of Urogastrone, Am. J. Digest. Dis. **8**: 365 (Oct.) 1941.

30. Quigley, J. P.: Enterogastrone: Significant Steps in Development of the Present Conceptions, Am. J. Digest. Dis. **8**: 363 (Oct.) 1941.

be given to the future welfare of the patient. So, in advising surgery, the temperatment of the individual must come in for as exacting consideration as his physical status. "Jitterbugs" are poor subjects for surgery. As the general practitioner frequently has the deciding voice concerning operation, he should inform himself of "the trends of good surgical experience" and of the prospects of a "cure" for his patient, and he should know that a "cure" is based in large measure on the temperament and the cooperation of the patient as well as on the judgment and ability of the surgeon. Both the physician and the surgeon should make a more serious effort to prevent complications. I believe such efforts carry more promise of success than does the surgical treatment for the complication.

As for the type of operation, it is being accepted that conservative surgical procedure, such as gastroenterostomy and pyloroplasty, are no longer justified as routine operations for gastric or duodenal ulcer.[24] While the arguments for wide resections are reasonably sound—and the mortality rate in the hands of the best surgeons is invitingly low—and the immediate prospects for the patient relatively good—the annoying thought obtrudes itself that eventually nature will compensate for the loss of three fourths of the stomach by enabling the remaining fourth to take up the function of the removed portion, and who knows but the curse of acidity, for which the operation was done, will be upon us again! In fact, just that has already occurred. The surgeon who is unfortunate enough to have a patient develop a jejunal ulcer following subtotal resection of his stomach may never see or hear from that patient again. His follow-up statistics, therefore, to carry significance, should take into consideration all "absentees." That jejunal ulcers are going to occur after partial gastrectomy as they did after gastroenterostomy, though perhaps not so often, depending on how much of the stomach is removed, is a matter I believe more and longer follow-up studies will reveal. Within two weeks I have encountered 2 cases of jejunal ulcer, 1 having perforated, following partial gastrectomy for duodenal ulcer. Lahey [31] reports he has had seven proved postoperative jejunal ulcers in a series of 137 consecutive subtotal gastrectomies. I would plead therefore for a more critical comprehensive analysis over a long term period of all ulcer cases with especial consideration given to the variations that occur in the life cycle of ulcer, whether it is medically or surgically treated, before too positive opinions are expressed in favor of one or the other.

SUMMARY

To summarize this question of surgery, then, I would recommend that operation only be considered in selected, complicated cases of ulcer. With growing enlightenment on the pathogenesis of ulcer, it might be well to reconsider the virtues of conservative surgery.

While at the present time there would seem to be no satisfactory alternative to radical surgery, in complicated cases let it be done with the definite understanding that elimination of acidity is not the last word in the treatment of ulcer, and that patients with ulcer, as surely as those with diabetes, tuberculosis or pernicious anemia, are candidates for future trouble unless physisicians and surgeons remember that the disease may be arrested but not cured!

Rittenhouse Plaza.

31. Lahey, F. H.: Indication for Gastric Resection, Am. J. Digest. Dis. 8:180 (May) 1941.

ABSTRACT OF DISCUSSION

DR. SARA M. JORDAN, Boston: Among the many important points which Dr. Boles stresses none is more important than the question of when the ulcer is to be medically treated and when it is to be surgically treated. This involves a consideration of the etiology of the ulcer. Dr. Boles has in recent years shown us some data on the effect of the midbrain on alterations of circulation in the stomach, which to my mind are synchronous with the spasm which occurs in the stomach and which, when talking about acid, one has in the back of one's mind as part of the picture. It is a question not only of treating acid but of treating spasm. When we say we treat acid and treat spasm, we really mean we are treating the ulcer by combating acid and by combating spasm. Dr. Boles warns us that perhaps we are sometimes talking about intractable ulcer when we really mean an intractable patient. That is true, but I think he will agree that when a patient has been intractable long enough the ulcer often becomes intractable. This is especially true when the ulcer is located on the posterior wall of the duodenum or the posterior wall of the stomach, and the penetration of the ulcer involves the pancreas, with the resultant pain. Dr. Boles's admonition is useful when surgical resection of the stomach looks so easy in skilled hands and when the results are so good and when the risk is so low. The surgeon may often be easily induced by the internist who has become weary of trying to manage the patient to perform the operation when perhaps it is not really necessary. The person who is emotionally tense and often the one who is well controlled externally is the one who needs the best psychiatric guidance when he has an ulcer diathesis. One of the things we must remember in dealing with gastric ulcer is to be sure that the ulcer has fulfilled all the criteria which are so well established for the permanent healing of ulcer, namely the disappearance of the x-ray defect, of symptoms and of occult blood, and, in the judging of the disappearance of the x-ray defect, the complete assurance that there is absolutely nothing left of that x-ray defect, not even the slightest bit of induration in the stomach wall. It is believed now that any gastric ulcer which recurs should be regarded as, at the present or in the future, a malignant lesion. We have in our department a group of patients whom we saw perhaps ten years ago, with hyperchlorhydria and with pyloric spasm and evidences of duodenal change and whom we have been successful in keeping under our care and who have not developed ulcer. In another small group, in which we were not able to control the diet and habits, an ulcer has developed. I think it is not out of the realm of possibility to try to prevent ulcer.

DR. FRANK H. LAHEY, Boston: I feel strongly about this question of prevention. There is not any doubt in my mind that if one could frighten people before they are faced with a catastrophe and get them to adjust their habits—smoking, eating, drinking and working habits—so that they would devote the same serious attention to their alteration at that stage as they will after they have had two or three hemorrhages, then I think probably one could do a great deal as relates to the prophylaxis of ulcer. Apparently it is a human attribute not to accept an ulcer as really serious until there have been two or three hemorrhages that threaten fatality or the patient has had pyloric obstruction or perforation. No one today, I think, can defend primary surgery in the treatment of ulcer. All our ulcer patients come to us only as medical failures. They represent the intractable posterior wall ulcers. We in surgery see many anterior wall ulcers in the course of cholecystectomies and other operations, represented then only as scars, but they are the interperitoneal ulcers that in this anterior position can fold themselves in. The posterior wall ulcers are, of course, mechanically the same problem as the calloused, chronic varicose ulcer above the ankle—it is fibrosed, it has lymph stasis, it has venous stasis, it lacks oxygen and it is mechanically unable to fold itself in—and so that type of ulcer is our major problem. I wish it were possible to improve our figures in gastric cancer, they are so bad, so many patients come so late. There is certainly one thing that I would like to preach as a result of experience and that is that it is the duty of the medical men and the gastroenterologist to follow carefully and to accept the responsibility for following those patients with low gastric acids and any question of a lesion by x-rays. It is in the patient with low

gastric acids that one should be sure that he does not place the responsibility for return check-up examinations on the patient but that the doctors take it. It is this group with low gastric acids and anacidity who have lesions that are debatable. We agree that we have never seen a benign ulcerating lesion on the greater curvature; we agree about the dangers of prepyloric lesions. But there are certain patients with prepyloric spasms who require exploratory operation to be certain that they do not have cancer. In some of these cases the simulation of a malignant condition is so great that one cannot safely say, even with a gastroscope, that it is not malignant. Gastroenterostomy should not be routinely applied, because it leads to high incidence of gastroduodenal ulcer. It is equally bad for every patient to have a subtotal gastrectomy. I would infinitely rather do a somewhat unsatisfactory operation on a bad risk patient such as gastroenterostomy and have him alive and have him take his risk of 16 per cent of gastroduodenal ulcer than submit him to an undue risk of subtotal gastrectomy.

DR. HYMAN I. GOLDSTEIN, Camden, N. J.: Dr. Boles mentioned the great increase in cigaret smoking since the first world war. Millions of women, some of whom now also serve with our army and navy, smoke a great many cigarets, and I wonder if gastric disturbances, including gastroduodenal ulcer, will increase among women during this present crisis. May I ask the author how he would correct or attempt to cure the "ulcer diathesis," which he finds so important a factor in ulcer etiology. Ancient writers knew of the relation of disturbances of the brain and mind to the occurrence and aggravation of gastritis and ulcer of the stomach—Diocles (fourth century B. C.), Galen (130-200 A. D.), Fabricius Hildanus (1560-1634), Rhodius (1587-1659), Jean Fernel (1497-1558), Jean Riolan (1539-1605), Joannes Heurnius (van Heurne, 1543-1601), Capivaccius (died 1589) and others. Galen (On Prognostics, chapter XI) recites how he treated Emperor Marcus Aurelius (121-180 A. D.) for his aggravated stomach trouble and "indigestion" after his battles. Galen also quotes Diocles (fourth century B. C.) under "De Melancholia" (in De Locis Affectis, Paris, 1513, book III, chapter VI), giving a complete and accurate description of ulcer symptomatology and its relation to mental disturbances. As to modern medical management of ulcer, it is no different than in the time of Celsus (35 B. C.?-27 A. D.?). Celsus gave a special "soft smooth diet without acid or acrid substances, and light wine to be not too hot or too cold." Paul of Aegina (625-690 A. D.), Sexapion (ninth century), Jean Fernel (1497-1558), J. Varandæus (died 1617), Joannes Scultetus (1595-1645) and others treated ulcer of the stomach, as we do today, with terra sigillata (kaolin or aluminum silicate) and other preparations to protect the erosions and ulcerations. Paul, thirteen hundred years ago (book III, section 37) discussed "Affections of the Stomach," as did Macellus Empiricus (379-460? A. D.), Oribasius (325-403 A. D.), and Aëtius Amidenus (502-575 A. D.) before him, and he gave terra sigillata (aluminum silicate), Samian earth, Lemnian earth and milk and starch to protect the eroded and ulcerated gastric mucous membrane. Scultetus (1622) says this treatment stimulates the healing of ulcer of the stomach by protecting it, just like wax put on an inflamed foot. Time does not permit more than mention of the names of Rhazes (860-932), Hally Abbas (930?-994), Avicenna (980-1036), Albucasis (1013-1106), Avenzoar (1070-1161), Averrhoës (1126-1198) and Franciscus de Piedmont (1265?-1319) in this connection.

DR. RUSSELL S. BOLES, Philadelphia: I did not state that the preoperative study is vitally important, and no doubt Dr. Lahey, being the competent surgeon that he is, would acknowledge that his successes are somewhat due to the competent preoperative study that his patients get under Dr. Jordan and in the gastroenterologic clinic. I agree with Dr. Jordan on the different measures of combating acidity except for pyloric gastric resection. I think that is an unjustifiably radical step for combating acidity. As far as the congenitally intractable patient is concerned, I can't conceive of any operation helping him. He is going to continue to be intractable and therefore to continue having trouble, no matter what kind of operation he has. Dr. Lahey drew attention to cases with adhesions to the pancreas, which explain some of the intractable ulcers. I agree that there should be no question in any of our minds that we do have to resort to radical measures for the correction of such complications. Dr. Jordan questioned some of the symptoms that I emphasized in my paper, and I want again to emphasize that in my experience they are symptoms of early malignancy. We are not usually in doubt about the symptoms of late, well established, lesions but I still maintain that a persistently poor appetite is not necessarily a symptom of late cancer. Dr. Jordan raised the question of operating for recurrent gastric ulcers and mentioned that they are the ones that, in a certain percentage of cases in her experience, are going to be malignant. I should like to ask her in turn why, if such ulcers are malignant, do they heal? I don't understand how a malignant ulcer is going to heal and then recur again and maybe again and again. The medical failures are pretty desperate cases that have to be met with, and I am in sympathy with them; but I cannot altogether feel that a gastric resection is all we can do. When that is all that is left for Dr. Lahey, that is one thing, but I disapprove of the tendency of many other surgeons to do radical operations when there are plenty of both preventive and medical measures left. I found the slides presented by Dr. Goldstein interesting. He asked how we are going to relieve the ulcer diathesis. I don't think we have any better way of doing that than he has. All we can do for those patients is to relieve the factors that we know do seem to precipitate ulcer. He mentioned children and asked why children get ulcers when they are under no strain. There are lots of children who are under strain, with their problem parents and many other things. I could give plenty of reasons why some children get ulcers.

MOTILITY OF THE HUMAN COLON

THE NORMAL PATTERN, DYSKINESIA AND THE EFFECT OF DRUGS

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"Constipation," diarrhea, distention and colic are common complaints which may result from temporary or prolonged alterations of the normal pattern of the colon. Yet there seems to be a paucity of knowledge regarding the motor activity of the human colon and much divergence of opinion regarding its response to stimulating and "antispasmodic" drugs.

Alvarez,[1] in summarizing our knowledge, says "The colon is a sluggish organ with few and slow movements. The movements of the haustra are very slow. A few times a day there are 'mass movements' which carry material usually from the transverse colon over into the sigmoid region. Much of the progress of material in it seems to be due to the pressure exerted by new material coming down from above."

The concept that material from above exerts a sort of "plunger" effect on material below is due primarily to the inadequacy of the x-ray method for studying colonic motility. The x-ray method provides an outline of the colon and yields precise information regarding rapid movements in the colon such as occur in "mass movements" and defecation. The method rarely reveals those movements which are responsible for transporting material for short distances, and it does not reveal in a qualitative and quantitative manner the correlation or

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1. Alvarez, W. C.: An Introduction to Gastro-Enterology, New York, Paul B. Hoeber, Inc., 1940.

lack of correlation between the different types of motility present simultaneously in adjacent segments of the colon. This explains why Todd,[2] regardless of his extensive studies, "could not see how material moved forward from the cecum to the ascending colon." Because his observations were so extensive, he did observe contractions which at times affected one segment after another in the transverse colon. We shall emphasize later the importance of the segmental activity observed by Todd.

The variable effect of drugs on the human colon is enigmatic unless one knows that different types of motility exist in different segments and that the type of motility conditions the response. It will be seen that some drugs affect propulsive motility, others affect tone and nonpropulsive motility and others appear to act by improving the coordination between segments.

METHODS

The introduction of the tandem balloon method [3] for the study of motility has revealed that (*a*) the activity in different segments varies, (*b*) to obtain propulsion of contents the activity of adjacent segments must be coordinated, (*c*) to comprehend a complete picture of the motility repeated continuous records of several hours' duration must be made and (*d*) two or more segments must be studied simultaneously. Also with the tandem balloon method it is possible to determine when the motor activity of one segment is propagated to an adjacent segment.

To measure the propulsive force of a contraction we constructed special apparatus.[4] The use of this apparatus and the passage of contents from a colostomy yield direct evidence of propulsive activity.

Preliminary experiments were performed on trained, unanesthetized dogs.[4] The results guided our experiments on the human colon. Four human subjects with colostomies were studied mornings and afternoons for eight months. The rectum and lower sigmoid of each had been removed six to eighteen months previously and the subjects were in excellent condition. Patients were studied an hour after breakfast when the colon and sigmoid were empty and again after a standard luncheon. We started with a three balloon system which was discontinued, because occasionally after drugs which stimulated propulsion the balloons were tied into a knot, rendering their removal hazardous. We then used one or two balloons. Our results on human beings pertain only to the descending colon, from the splenic flexure downward to the colostomy.

RESULTS

Control Studies.—In order to obtain quantitative and qualitative control studies of the motility of the human subjects continuous records were made during seventy periods of at least one hundred and fifty minutes each. Additional control periods were interspaced during the drug experiments. Control records of from twenty to thirty minutes were obtained before the drugs were administered. Under usual conditions contents were not discharged from the colostomy. Unless these patients had diarrhea they expelled no further contents after the early morning enema.

Amount of Motility.—Control records revealed that there are periods of quiescence and activity in the human [5] and canine [3] colon. The activity of the segments varies, but at times all segments are quiet. About 50 per cent of the time there is motor activity, of which only 10 per cent is propulsive; the remaining activity is local, segmental and nonpropulsive with varying degrees of tone.[5]

Coordination of Segments.—After many records were observed it became evident that adjacent segments had to manifest coordination before a propulsive wave in one segment could "pass" to an adjacent segment. Sometimes a propulsive wave would start in one segment, and the type of motility in the adjacent segment would be modified. Then the propulsive wave would appear in the adjacent segment. At other times a propulsive wave would start and the motility of the distal segment would not be modified. This indicated either that the propulsive wave was very local or that the distal segment was not integrated so as to receive the propulsive wave.

Colonic Dyskinesia.—These facts suggested that stasis could occur if a segment could not "receive" a propulsive wave. Furthermore, when a strong propulsive wave occurred in one segment and the distal segment was manifesting nonpropulsive activity on considerable tone, the subject felt tension or a cramplike pain. The subjects frequently complained of cramps when a strong propulsive wave occurred in the proximal segment and failed to pass to the distal segment. A cramp did not occur if the propulsive wave passed to the distal segment and contents were expelled. In cases of diarrhea, liquid contents could pass through a hypertonic segment.

These observations suggest that some propulsive waves are confined normally to a segment of about 5 cm. in length. Other propulsive waves travel from one segment to a more distal segment and cause definite propulsion of contents. If the distal segment manifests rapid, rhythmic, nonpropulsive activity on considerable tone, it usually does not accept a propulsive wave. X-ray examination would detect this condition only by accident or, if the fluoroscope should be used for from ten to twenty minutes. "Constipation" could be the only symptom. However, if the distal segment manifests rapid, rhythmic, nonpropulsive activity on considerable tone, and then a relatively vigorous propulsive wave occurs in the cephalad segment, symptoms of distress may occur. However, the incompatibility of the wave type is not so common a cause of tension and pain as is the relative intensity of the propulsive wave in the cephalad segment and the degree of tone of the distal adjacent segment.

We use the expression colonic dyskinesia to indicate that ill motion between adjacent or successive segments of the colon which functionally produces sufficient obstruction to the propulsion of contents to produce stasis and symptoms of tension and pain. Or, as Alvarez might say, colonic dyskinesia represents a type of disturbance of the normal gradient of the colon. We believe the ill motion is due to an extrinsic or intrinsic disturbance of coordination. It is obvious that a saline cathartic by liquefying the contents might provide temporary relief but would have no effect on the underlying condition; it might aggravate the condition.

2. Todd, T. W.: Behavior Patterns of the Alimentary Tract, Baltimore, Williams & Wilkins Company, 1930.
3. Templeton, R. D., and Lawson, H.: Studies in the Motor Activity of the Large Intestine: I. Normal Motility in the Dog Recorded by the Tandem Balloon Method, Am. J. Physiol. **96**: 667 (March) 1931.
4. Adler, H. F., and Templeton, R. D.: Correlation of Transportation and Activity in the Dog's Colon, Am. J. Physiol. **128**: 514 (Feb.) 1940.
5. Adler, H. F., Atkinson, A. J., and Ivy, A. C.: A Study of the Motility of the Human Colon: An Explanation of Dysynergia of the Colon or of the "Unstable Colon," Am. J. Digest. Dis. **8**: 197 (June) 1941.

STIMULATING DRUGS

We have previously reported in detail our observations on the effect of certain drugs which stimulate the propulsive activity of the human colon.[6] For completeness it is appropriate to review the more important observations.

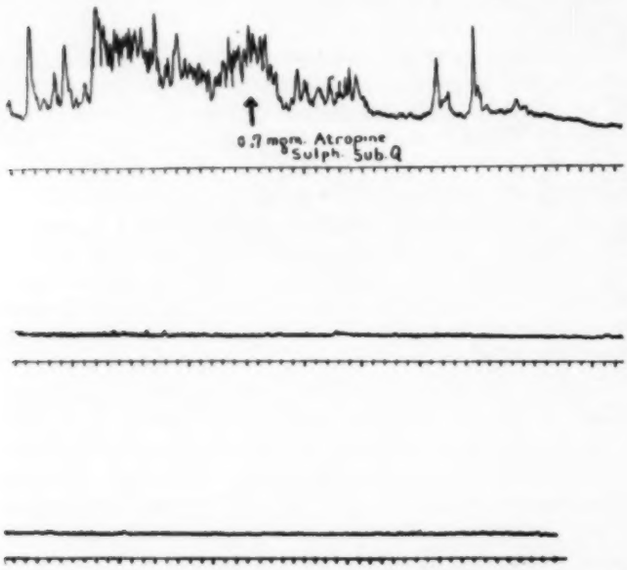

Fig. 1.—Complete cessation of motility in the human descending colon for ninety minutes after the subcutaneous injection of 0.7 mg. of atropine sulfate.

Solution of posterior pituitary (2 units intramuscularly) increased the propulsive motility of the colon in all our subjects. The response occurred after a latent period of a few minutes and occasionally lasted as long as twenty minutes. Prostigmine methylsulfate (0.25 to 0.50 mg. intramuscularly) increased both the propulsive and the nonpropulsive activity. The response occurred usually in twenty minutes and lasted one to two hours. This response was most striking. Ergotamine tartrate (0.25 mg. intramuscularly) had no definite effect; 0.35 mg. intravenously in our dogs caused increased propulsion and defecation occasionally. It was found, however, that 0.25 mg. of ergotamine would potentiate the action of prostigmine in human beings. Because of these observations, it was believed that a combination of solution of posterior pituitary, prostigmine methylsulfate and ergotamine tartrate would produce a prompt and sustained increase in motility. Accordingly, solution of posterior pituitary (1.25 units), prostigmine methylsulfate (0.25 mg.) and ergotamine tartrate (0.25 mg.) were injected at the same time intramuscularly. Propulsive motility occurred promptly in response to the solution of posterior pituitary and the tone and propulsive motility of the colon were augmented for six to eight hours. Contents were expelled throughout the entire day, indicating that the propulsive motility of the small intestine had also increased. The pulse and blood pressure tested at intervals were not changed, and the patients did not complain of side reactions at any time.

"ANTISPASMODICS"

Opium, belladonna and their derivatives have been used for years as so-called antispasmodics. More recently "spasmalgin," "benzedrine," "octin," "syntropan" and "trasentin" have been introduced. We have studied the effect of all these drugs on the human colon, some more intensively than others.

Morphine Sulfate.—Much evidence [7] has proved that morphine has no motility inhibiting action on the human colon. We used morphine sulfate to induce hypertonus of the dog's colon as a method for the assay of various alleged antispasmodics.

The hypodermic injection of 8 mg. of morphine sulfate increases the nonpropulsive motility and tone of the human colon (i. e., the part we studied). The hypertonus may persist without any evidence of propulsive motility for several hours, depending on the dose. In 3 instances our subjects reported with diarrhea. After collecting the discharge for a period, 8 mg. of morphine sulfate was administered. The discharge ceased with the disappearance of propulsive waves. Similar effects have been observed in a patient with an ileostomy.[7] Morphine obviously tends to constipate because it decreases or abolishes propulsive activity. It may relieve the pain in colon colic by central action, and possibly by altering motility from a propulsive to a nonpropulsive type.

The use of the multiple balloon technic reveals why some investigators have reported that morphine relaxes the colon. In our studies a decrease in tone in the presence of rapid, rhythmic waves occurred in one of the segments under observation in nine out of thirty-three tests. In other segments the tone was increased.

No so-called antispasmodic that we have used dramatically inhibits the hypertonus induced by morphine

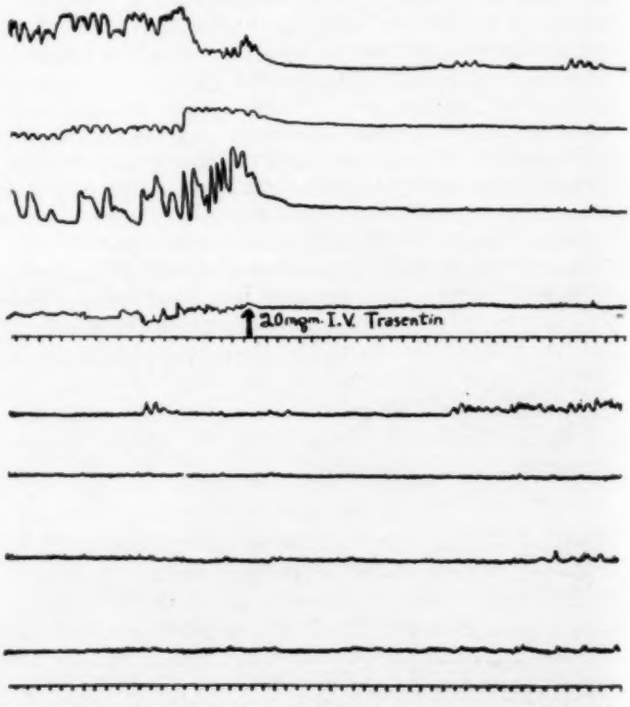

Fig. 2.—Complete cessation of motility of the canine colon for eighty minutes after 20 mg. of "trasentin" intravenously.

unless given intravenously (dog) in relatively large doses. If morphine hypertonus is similar to the hypertonus and spasm which occur in diseases of the colon, it is not surprising that physicians are searching for a uniformly potent antispasmodic.

6. Adler, H. F.; Atkinson, A. J., and Ivy, A. C.: Supplementary and Synergistic Action of Stimulating Drugs on the Motility of the Human Colon, Surg., Gynec. & Obst. **74**: 809 (April) 1942.

7. Adler, H. F.; Atkinson, A. J., and Ivy, A. C.: The Effect of Morphine and Dilaudid on the Ileum and of Morphine, Dilaudid and Atropine on the Colon of Man, Arch. Int. Med. **69**: 974 (June) 1942.

Atropine Sulfate.—Atropine sulfate was administered to our human subjects in doses (0.75 to 0.8 mg.) just sufficient to cause some dryness of the mouth. Smaller doses have no definite effect. In 5 instances, the spontaneous motility was completely abolished for one to two hours (fig. 1). In three tests, the amplitude of the contractions was diminished and the periods of quiescence were increased. In two the nonpropulsive motility was unaffected but propulsive motility did not occur. These effects were, of course, analyzed by comparison with control motility records.

Quantitative Data Pertaining to the Action of Antispasmodics Studied on the Human Colon

(Experiment on Four Men)

Number of Tests	Drug Used	Average Total Motility * 50 Minute Periods			Average Propulsive Motility † 50 Minute Periods		
		1	2	3	1	2	3
70	Control	53	57	50	13	10.5	7.5
33	Morphine sulfate, 8, 10, 16 mg. intramuscularly	87	91	89.4	3.1	2.4	3.8
10	Atropine sulfate, 0.7 and 0.8 mg. intramuscularly	34	27.6	**38.5**	2.8	3.2	3.6
6	Morphine 8 mg. and atropine 0.7 mg. intramuscularly	64	69.3	68.4	2.0	1.8	2.3
16	"Trasentin" 50-75 mg. intramuscularly	38	35	**39.5**	9.6	11.2	13
17	"Trasentin" tablets 75-225 mg. orally	36	41.5	**41.4**	12	10.4	9.4
10	Amphetamine sulfate, 10 mg. intramuscularly	50.8	48 9	48.2	10.6	9.8	7.8
12	Amphetamine sulfate, 10 mg. orally	50	55.4	48.5	12.5	12.2	8.7
12	"Octin" 100 mg. intramuscularly	58.5	52.5	47.6	10	9.6	10.6
14	"Octin" 150/300 mg. orally	50.6	56	52.6	13.6	13.8	10.8
12	"Spasmalgin" orally	54.5	86.5	84.5	8.8	3.6	4.0
10	Syntropan 10-20 mg. intramuscularly	53.6	49	47	13.3	14.5	9.8

* Total motility: time in percentage that the colon is active per 50 minute period of experimental time.
† Propulsive motility: expressed in percentage of total motility.

It has been shown that atropine has some antagonistic effect on the increase in tone and nonpropulsive motility induced by morphine in the dog's colon. Only six experiments of this nature were done on our human subjects because morphine must be given with caution, and the results were identical with those obtained on the dog. A combination of atropine sulfate (0.7 mg.) and morphine sulfate (8 mg.) was injected intramuscularly. Propulsive motility was abolished for two hours and tone and nonpropulsive motility were partially antagonized. This is shown in the accompanying table.

The combination of papaverine hydrochloride ⅓ grain (0.02 Gm.), pantopon [8] ⅙ grain (0.01 Gm.) and sulfuric acid ester of atropine $\frac{1}{60}$ grain (0.006 Gm.) has been referred to as "spasmalgin." We used it because these drugs are supposed to have antispasmodic action. The aforementioned dose was given orally to our subjects. From forty to sixty minutes later the tone and nonpropulsive motility were increased, and propulsive motility disappeared in nine of twelve experiments for a period of seventy minutes. The action of "spasmalgin" has been reported previously in similar experiments.[9]

We have not studied the effect of papaverine and pantopon separately on the human colon. Bargen and Jackman,[9] using the single balloon technic, report that pantopon acts much like morphine and that papaverine hydrochloride usually but not always causes a decrease in tone.

Amphetamine Sulfate ("benzedrine").—Amphetamine sulfate has been used in the management of colonic distress as an antispasmodic,[10] supposedly to stimulate sympathetic nerve endings and thereby inhibit the colon. We gave 10 mg. orally or intramuscularly and did not give larger doses that might disturb sleep. The pulse rate of all subjects was increased.

The effect on colonic motility was not definite. In all of twenty-two experiments the quantity of both propulsive and nonpropulsive motility was not altered. In eight of the twenty-two experiments there seemed to be some depression of the tone and amplitude of the contraction; in seven the coordination of the motility between segments, compared to control records, appeared to be improved, but not decisively; in the remaining seven no effect was discernible. No definite quantitative effect was recorded.

In other studies in which we have administered the same amount of amphetamine sulfate, some subjects have reported a "call to stool" when central stimulation by the drug became definite. This might be due to the central effects of the drug, though it is possible that the qualitative improvement in the coordination between segments facilitated passage of contents to the rectum.

Diphenylacetyl-Diethylaminoethanol Hydrochloride ("Trasentin").—This synthetic alkaloid with an atropine-like action was studied intensively. When given intravenously to the dog it counteracted morphine-induced hypertonus better than any drug we have used to date except atropine. This is compatible with the theory that it acts directly on smooth muscle.

Canine Experiments: In fifteen experiments 10 to 50 mg. of the drug was given intravenously to our trained dogs with colostomy. The propulsive and nonpropulsive spontaneous motility were depressed or abolished for as long as eighty minutes (fig. 2). The records of the tandem balloons showed that the distal colon usually is depressed longer than the proximal colon. Atropine sulfate has a similar differential action.[11]

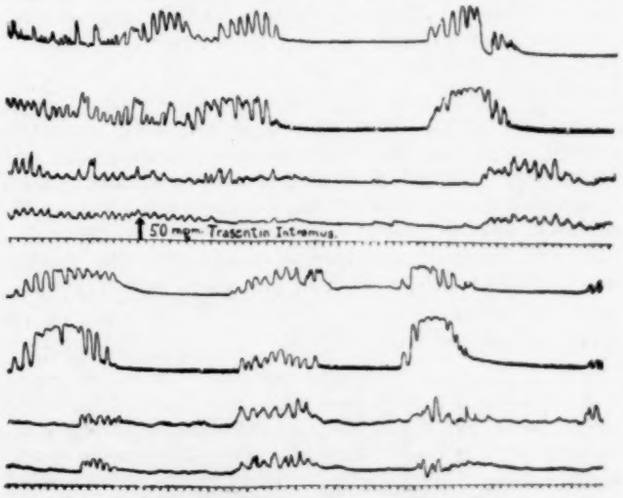

Fig. 3.—Periodicity and improvement in coordination of segments of the colon in the dog after 50 mg. of "trasentin" intramuscularly.

8. Pantopon is a preparation containing the hydrochlorides of the alkaloids of opium, principally morphine.

9. Bargen, J. A., and Jackman, R. J.: The Influence of Papaverine on Muscular Tone of the Intestinal Tract, Surg., Gynec. & Obst. **68:** 749 (April) 1939.

10. Ritvo, Max: Drugs and Roentgen Examination of Action of Mecholyl, Physostigmine and Benzedrine in Overcoming Sluggishness and Spasm, Am. J. Roentgenol. **36:** 868 (Dec.) 1936. Rosenberg, D. H.; Arens, R. A.; Marcus, Philip, and Necheles, Heinrich: Benzedrine Sulfate: Its Limitations in the Treatment of Spastic Colon and a Pharmacologic Study of Its Effects on the Gastrointestinal Tract, J. A. M. A. **110:** 1994 (June 11) 1938.

11. Adler, H. F., and Ivy, A. C.: Morphine-Atropine Antagonism on Colon Motility in the Dog, J. Pharmacol. & Exper. Therap. **70:** 454 (Dec.) 1940.

In nine experiments hypertonus of the colon was induced by intramuscular administration of 16 mg. of morphine sulfate. Intravenous injection of 25 mg. of "trasentin" immediately depressed motility and tonus for a period of about twenty minutes. The intravenous injection of "trasentin" was usually not toxic to the dog. It was slightly toxic when given with morphine sulfate, as was indicated by salivation, apprehension and an increase in pulse rate. Unfortunately when as much as 200 mg. of "trasentin" was administered intramuscularly (twenty experiments) it had no effect on the hypertonus induced by morphine.

The effect of 50 to 200 mg. of "trasentin" intramuscularly on the spontaneous motility of the colon was then studied in twenty experiments. The total motility of the colon was decreased approximately 15 per cent, which is less than that usually resulting after 1 mg. of atropine sulfate. However, the doses of "trasentin" used had a very definite effect on the quality of motility. The periods of activity of the various segments became more uniform and the coordination between different segments was definitely improved. The propagation of a wave of activity from one segment to the next now occurred in sequence (fig. 3) more frequently than under normal conditions. In this connection, Spier, Neuwelt and Necheles [12] observed that "trasentin" only partially depressed the motility of the alimentary tract and in so doing seemed to restore the normal gradient.

Human Experiments: In the 4 human subjects thirty-three experiments were performed in which 50 to 75 mg. of "trasentin" was given intramuscularly or 75 to 225 mg. orally. The route of administration in the dosages used made no significant difference in the results. In ten of the tests a 35 per cent decrease in total motility occurred (fig. 4) in fifteen, or 14 per cent; and in the remainder with the smaller doses no decrease occurred. In every test but five the quality of motility was definitely influenced. The motility became more periodic, the periods of activity being separated by periods of quiescence. As in the canine tests, the coordination between segments was improved.

In 3 instances the drug was given orally when the patients reported with diarrhea and cramps. The balloons were inserted, a control record was made and the drug administered. One patient received 75 mg.; the motility became more regular and the cramps were relieved. The same response occurred in the 2 other patients who had been given 225 mg.; this dose, however, caused a gradual decrease in the tone of the colon in both subjects (fig. 5).

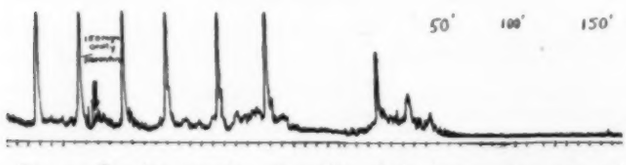

Fig. 4.—Complete cessation of motility of the human colon after 150 mg. of "trasentin" orally.

It was observed that after an oral dose of 225 mg. the subject sometimes complained of a burning sensation in the epigastrium. In 2 instances, morphine sulfate was given four hours after "trasentin" (225 mg.). The patients became apprehensive, their pulse rate increased, and they complained of slight malaise. This we interpreted as being due to "morphine-trasentin" incompatibility,[13] mentioned in the case of the dog. For this reason we could not determine in man the effect of "trasentin" on the hypertonus of the colon induced by morphine. We believe it is important to remember that morphine sulfate and "trasentin" should not be used in close sequence clinically.

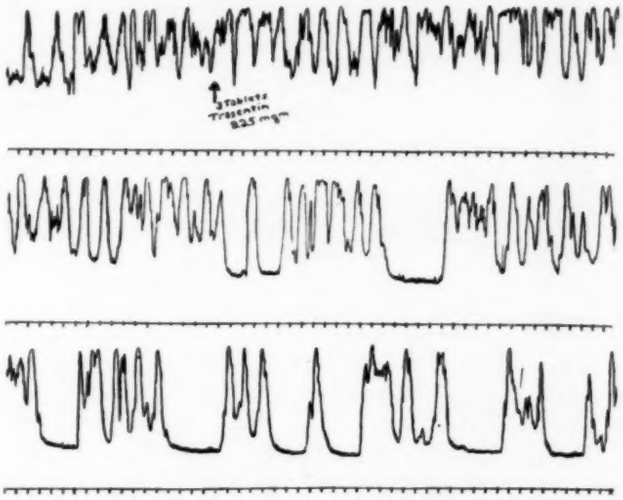

Fig. 5.—Reduction in the quantity of motility and tone and a return toward periodicity in a segment of the descending portion of the human colon after 225 mg. of "trasentin" orally. In the upper tracing the tone is high and the movements relatively rapid, a type of motility that is not conducive to propulsion when present in two adjacent segments.

Methyloctenylamine Hydrochloride ("Octin").—This drug was administered to our 4 human subjects in the doses shown in the table. The drug did not alter the normal control pattern of motility in our subjects within two hours. In 1 instance after being given 2 tablets (300 mg.) the patient reported increased propulsion of colon contents.

Syntropan.—This drug was administered intramuscularly in doses of 10 or 20 mg. in ten experiments. No effect was discernible in our records (table). This was not anticipated because the drug has a spasmolytic action on the isolated rabbit's intestine. However, this drug has peculiar pharmacologic properties: It has an oxytocic action on the intact uterus of the guinea pig, rat and dog.

COMMENT

Our observations show that it is important to consider the quality as well as the quantity of motility in the study of the human colon. It is important, we believe, to distinguish between the two functional types, namely the propulsive and the nonpropulsive motility. The knowledge that different types of motility may occur in adjacent segments of the colon and that the type of motility in adjacent segments influences the extent of travel of a propulsive wave aids in the comprehension of colonic dyskinesia and its consequences. It seems to be apparent from our records that the existence of a normal gradient in the colon depends on the existence of coordination between the various functional segments of the colon. The more intimate nature of the coordinating mechanism is uncertain.

Atropine sulfate and "trasentin" were clearly the best depressants of spontaneous colonic motility among the drugs studied. In the doses used, atropine sulfate (0.8 mg. intramuscularly) produced a more decided

12. Spier, Ernst; Neuwelt, Frank, and Necheles, Heinrich: Clinical Study of a New Synthetic Spasmolytic Drug, Diphenylacetyl-Diethylaminoethanol, Am. J. Digest. Dis. **6**: 387 (Aug.) 1939.

13. Van Duzen, R. E.; Slaughter, Donald, and Winter, I. C.: The Effect of Trasentin and Morphine on the Urinary Bladder of the Unanesthetized Dog, J. Urol. **44**: 667 (Nov.) 1940.

depression than did "trasentin" (75 mg. intramuscularly). Although "trasentin" did not abolish motility as a rule, it did improve the coordination between segments and established a gradient or type of motor pattern conducive to propulsion. Atropine sulfate may be found to have the same action if graded doses are employed. But it should be noted that the larger doses of atropine sulfate depress both propulsive and nonpropulsive motility.

Our results on the effect of atropine sulfate and "trasentin" in therapeutic doses on the hypertonus of the dog's colon induced by morphine provide an explanation of why these drugs are not uniformly successful in the management of colonic colic. If the hypertonus in the colon or one of its functional segments is too great, these drugs in ordinary therapeutic doses, which do not give rise to objectionable side effects, will have little or no effect. Ideally we need a drug which specifically antagonizes the hypertonic segments without altering the normal segments. This may be asking for the impossible. At least we should like to have a drug which in nontoxic doses counteracts morphine induced hypertonus to a greater extent than atropine sulfate and "trasentin" do.

Our results demonstrate that before it is claimed that a drug depresses colonic motility in man the drug should be studied on patients with a colostomy, using preferably a two balloon system. At least such a study should be conducted on the trained colostomized dog, since the results on isolated segments of intestine are apparently unreliable. It also is our belief that a drug should be assayed several times on the same and different subjects; the effect of one or two administrations may lead to erroneous interpretations. However, drugs which do not paralyze the intestine may be useful clinically. Such drugs may affect the mechanism, causing the dyskinesia without significantly affecting normal mechanisms.

SUMMARY

The normal pattern of the motility of the human colon has been studied in a series of 4 men with a colostomy by repeated experiments over a relatively long period. We have attempted to explain how an alteration of the normal pattern, by influences which affect the coordination between segments, may produce "constipation" and symptoms of tension and colic. The effect of various drugs on the propulsive and nonpropulsive motility was studied. Simultaneous injection of solution of posterior pituitary (1.25 units), prostigmine methylsulfate (0.25 mg.) and ergotamine tartrate (0.25 mg.) was found to cause a prompt and prolonged increase in the propulsive motility of the human colon without side reactions. Morphine sulfate (8 to 16 mg.) is not an antispasmodic in the sense that all motility is inhibited. It increases the tone and nonpropulsive motility and definitely decreases or abolishes the propulsive motility. Of the various "antispasmodic" drugs studied, atropine sulfate and "trasentin" proved to be the most potent depressants. Atropine sulfate (0.7 to 0.8 mg. intramuscularly) may abolish all spontaneous motility of the colon for a brief period, whereas "trasentin" (50 to 75 mg. intramuscularly) is less likely to do so. "Trasentin" may depress nonintegrated motility in such a manner that propulsion is favored and a normal gradient established. The effect of these drugs is more striking on the distal than on the proximal colon of the dog. The ideal "spasmolytic" drug for the colon has yet to be discovered.

303 East Chicago Avenue.

ABSTRACT OF DISCUSSION

DR. WALTER C. ALVAREZ, Rochester, Minn.: When these studies were published, I wrote Dr. Atkinson to tell him how valuable I thought they were. It seemed to me that they threw light on the problem of the patient who says that his distress is due to the fact that gas does not move onward. I have long suspected that in these cases the contractions are localized and are not propulsive and wavelike. A man can swallow a lot of air and pass it through the bowel without any distress, while the gas which forms after the eating of some food to which he is allergic seems to stay in one place and will cause pain for an hour or more. I was interested in the authors' discovery that in different persons there are different patterns of colonic activity with different ratios of the comfortable, wavelike contractions to the uncomfortable, nonprogressive contractions. I suspect that persons with a sensitive bowel and a tendency to mucous colics have more of the nonprogressive contractions. Years ago I found that any poison, such as nicotine or anoxemia, which injures the synaptic nervous mechanism in the intestine wipes out the propulsive type of wave and leaves what I call a systolic type of contraction of many parts of the intestine at one time. It seemed to me that the systolic type of contraction might well cause pain. I am pleased to see that in a pharmacologic study some attention is now being paid to the influence of drugs on the two types of waves. I have always felt that our knowledge of the pharmacology of the intestine would never advance until research workers noted particularly the action of drugs in producing the propulsive type of contraction.

DR. J. P. QUIGLEY, Cleveland: The report by Dr. Atkinson and his associates represents a serious, painstaking investigation of three intestinal problems: (1) the fundamental physiologic motility of the colon; (2) the deviations from the normal which occur in dyskinesia and so forth, and (3) the action of drugs on this normal and abnormal motility. The pharmacologic results can be generally accepted as reported. They constitute a valuable contribution, and the value will be augmented if subsequent investigations demonstrate that the abnormal colon responds in a manner similar to the normal. Certainly there is reason to anticipate that the combination of solution of posterior pituitary, physostigmine and ergotamine found so effective in augmenting colonic propulsion should be effective in relieving the distressing distention from intestinal gas which plagues the individual who ascends to a high altitude. The proposed interpretation of the results is so important that one might wish that the differentiation between propulsive and nonpropulsive motility was made by a direct method involving the measurement of the rate at which something was transported through each portion of the colon. Especially adapted types of roentgen or multiple boli studies may be suggested. Accurate determinations of the pressure gradients at adjacent segments of the bowel would also be desirable. To attempt this differentiation by any indirect method such as balloon studies is less satisfactory, since it involves many loopholes.

DR. JAMES W. WILTSIE, Binghamton, N. Y.: I wish to show two slides illustrating mass movement in the colon. The roentgenograms in this case were taken by a small portable machine of 15 milliampere power. The exposure time was eight seconds. I discovered, incidentally, that short time exposures produced the effect of actual motion. Several patterns of transport movement are found to occur in the colon. Originally this case was one of fecal impaction in the cecum and ascending colon. Seven irrigations were required to clear the colon of this impaction. The first slide is that of a barium sulfate enema introduced immediately after the seventh irrigation. The exposure was made two or three minutes after introduction of the enema. Within this brief period the barium sulfate had reached the cecum and was being returned. The cecum is fixed by adhesions. The left half of the transverse colon shows a double shadow, the central denser portion indicating the diameter of this segment at the beginning of the eight second exposure, the lighter outer portion, the diameter at the end of the exposure. The streaked appearance of the shadow in the right half of the transverse colon indicates barium in motion. My interpretation of this film is that active dilatation in the left half of the tranverse colon is sucking the enema from the proximal por-

tion of the colon as the initial phase of a definite transport movement caudad. Since statements have frequently appeared in the literature to the effect that it is impossible to pass a colon tube beyond the rectosigmoid juncture, I wish to show several slides (of different patients) in refutation of this erroneous belief. Slide 3 shows beyond the possibility of successful contradiction that the tube has been passed as far as the hepatic flexure. Slide 4 shows the tip of the tube in the upper portion of the ascending colon. Slide 5 was taken after the tube had been in place at least fifteen minutes and indicates an attempt of the colon to expel it, as indicated by the large pelvic loop, recession of the tube from the midtransverse colon to the splenic flexure, and by a loop coiled in the rectum representing the expelled portion.

DR. A. J. ATKINSON, Chicago: Atropine and trasentin were clearly the best depressants of spontaneous colonic motility among the drugs studied. Intramuscular injection of 1¼ units of solution of posterior pituitary with 0.25 mg. of prostigmine and 0.25 mg. of ergotamine produced a prompt and sustained increase in motility without any undesirable side effects. I have used this combination of drugs successfully in cases presenting megacolon and other conditions of colonic stasis. The work reported is not just another drug study on the human colon; it is an attempt to correlate in a practical manner the knowledge that has been gained in the laboratory with various clinical problems.

PLATED OSTEOPERIOSTEAL GRAFT

EARL D. McBRIDE, M.D.
Assistant Professor of Orthopedic Surgery, Oklahoma University School of Medicine
OKLAHOMA CITY

The osteogenic virtues of the osteoperiosteal graft are unquestioned. This type of graft has been of secondary importance chiefly because it lacks the stabilizing rigidity of the cortical graft. Also, there is less confidence in the thinner graft for fear that it will not provide a preponderance of osteogenic material.

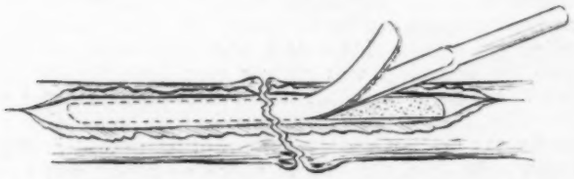

Fig. 1.—Preparation of the host bed. The periosteum is incised and elevated sufficiently for the cortex to be flattened uniformly to the size of the graft. Intervening fibrous tissue and callus are not excised or disturbed except as absolutely necessary to restore alinement.

However, it has been found that if the osteoperiosteal graft is compressed firmly to a freshened bed on the ununited fragments, resulting osteogenesis compares favorably with that of a full thickness graft, and the simpler surgical procedure permits its application in situations in which the more extensive bone sawing excavations would be contraindicated.

Phemister and Harkins [1] and Delangénière and Lewin [2] have described the advantages of the osteoperiosteal graft as a procedure in which they used ligatures and muscle pressure for fixation. The remarkable advances in the use of metallic fixation since the introduction of vitallium and especially hardened steel, together with the use of the sulfonamide compounds, have brought about many liberties in bone surgery not heretofore considered prudent or feasible. These two agents used with the osteoperiosteal graft make possible

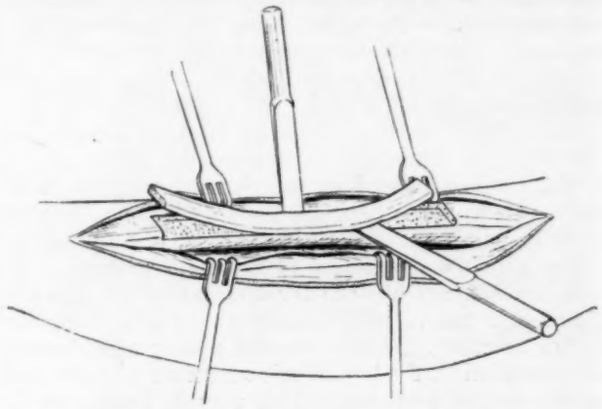

Fig. 2.—Excision of graft. Removal of osteoperiosteal graft 1/16 inch thick from the crest of the tibia by retracting the muscles from the lateral margin of the tibia and starting the chisel or bone saw transversely 1/16 inch below the crest. The graft is first outlined on the anterior surface of the tibia but is cut laterally from the crest rather than being chiseled out lengthwise, as is usually done. This is to prevent curling up of the graft and to insure uniform thickness.

the treatment of nonunion in instances in which the typical cortical graft could not be considered.

When the osteoperiosteal graft is squarely covered by a smooth, flat vitallium plate and gently but firmly squeezed to its bed on the bone fragments by the usual screw fixation, neither absorption nor necrosis occurs as one might think. On the contrary, such overlying support is a protection from erosive influences, and the firm contact of the graft to its host bed provides the necessary basis for plastic coalescence, just as compression by sponge pressure stabilizes the skin graft to create coherence. Such compactness of covered pressure and sealing-in effect lessens the exposure of the graft substance to attack by the processes of absorption and promotes the permeation of budding vessels and proliferating osteogenetic cells.

INDICATIONS

1. *Use in the Presence of Chronically Infected Tissue.*—When chronically infected tissue is present the use of such a method, together with the sulfonamide compounds, offers possibilities of using the bone graft in cases in which a more extensive operation of cortical graft would meet disaster.

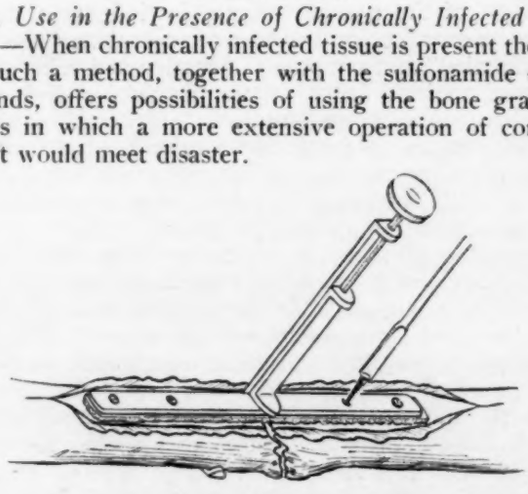

Fig. 3.—Plating of graft on fragments. Application of the metal plate directly on top of the graft, in the customary method. The graft can be tied to the plate by catgut previous to application, since there is a tendency for the graft to slip about under the plate while the drill holes are being made.

2. *Delayed Union.*—In cases of delayed union the more simple procedure of a plated osteoperiosteal graft is justified at an earlier date than one would resort to

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Read before the Section on Orthopedic Surgery at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1942.

1. Phemister, D. B., and Harkins, H. N.: Simplified Technic—Onlay Graft for Old Ununited Fractures in Acceptable Conditions, J. A. M. A. **109:** 501-506 (Nov. 6) 1937. Phemister, D. B.: Split Grafts in the Treatment of Delayed and Nonunion of Fractures, Surg., Gynec. & Obst. **52:** 376-381 (Feb., no. 2A) 1931.

2. Delangénière, Henri, and Lewin, Philip: A General Method of Repairing Loss of Bony Substance and of Reconstructing Bones by Osteoperiosteal Grafts Taken from the Tibia, Surg., Gynec. & Obst. **30:** 441-447 (May) 1920.

with the greater traumatism of a full thickness graft. Thus, instead of waiting and splinting over a period of months, during which adjacent joints become stiffened and tissues atrophied, an osteoperiosteal graft can be plated onto the fragments and passive motion begun in a few weeks with full confidence in the security of the fragments.

3. *Use as Sliding Graft in Tibia.*—In nonunion of the tibia the graft more often may be taken from the upper or lower fragment of the same leg, since atrophy or weakness in the graft material is not so great a factor with the use of the metal plate for internal fixation.

4. *Nonunion with Loss of Substance.*—In most cases in which there is considerable loss of bone substance one of the classic bone graft methods should be used.

Fig. 4 (case 12 in table).—Before and after application of plated osteoperiosteal graft. This was a severely mutilated hand with persistent sinuses, still poorly healed at the time of operation. There was considerable loss of substance. A bone graft made it possible to obtain movement in the ankylosed wrist.

However, the plated osteoperiosteal graft has proved very efficient in a number of instances in which the intervening fibrous space was not more than 1 inch.

TECHNIC

The anesthetic should be general. In compound fractures preoperative preparation should include attention to chronic scars, sinuses or ulcerations. Hot fomentations, local application of antiseptics and elevation of the part in bed may be necessary for several days prior to the operation. The incision for exposure of the ununited fragments should avoid scar tissue or healed sinuses as widely as possible. The graft is best taken from the tibia. In a previously infected field, when the graft is taken from one of the fragments of the tibia, there should be two carefully separated incisions. The graft should be taken first to prevent contamination, or the instrumentation should be divided, one for each field. The graft is cut very thin and accurately with a saw and a thin osteotome. The graft should be slightly larger than the plate in length and width.

Fig. 5 (case 12 in table).—Three months after operation, showing consolidation of the ununited fracture.

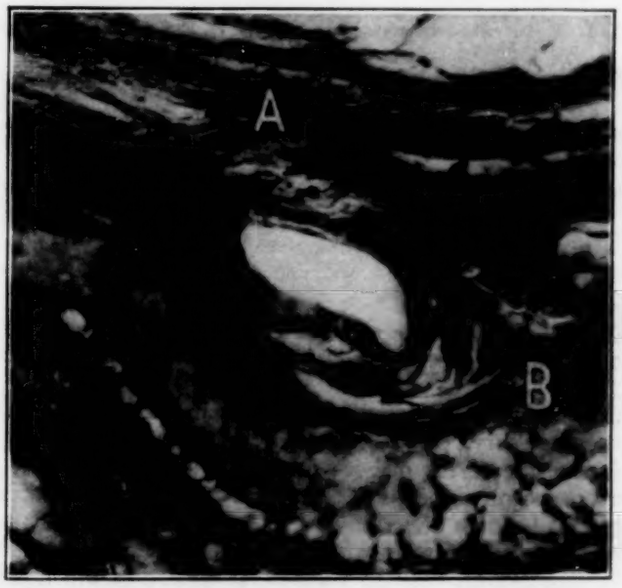

Fig. 6.—Photomicrographic section cut crosswise of osteoperiosteal graft and its bed after removal of the vitallium plate from its surface. Area *A* is the layer of fibrous tissue, originally the periosteum of the graft. Area *B* is the bone tissue of the host bed. Note the microscopic spear of ingrowth into the fibrous structure. New vessels have formed a cytogenetic relation between the new tissue introduced and the bone tissue in the neighborhood.

The manner of taking the graft is important in that the graft should be cut in uniform thickness. Instead of chipping it endwise with a chisel placed on the flat sur-

face of the tibia, it is preferable to retract the muscles from the lateral margin of the tibia and start the chisel or bone saw about 1/16 inch below the crest. By being cut transversely at this depth, parallel with the anterior surface of the tibia, the graft remains flat and does not curl up. Previous to cutting the bone laterally, one should make an outline of the size of the graft on the anterior surface with the osteotome, driving it 1/16 inch in depth (fig. 2).

PREPARATION OF HOST BED

The extent of readjustment of the fragments depends entirely on the nature of the malunion or deformity. The periosteum of the fragments should be carefully elevated and conserved. If at all possible, the intervening fibrous tissue and callus should not be excised or disturbed. Local trauma should be as mild as possible, especially when chronically infected scar tissue prevails (fig. 1). Burrows [3] and others have shown that resection or freshening of the bone ends in bone grafting is not necessary. With the periosteum retracted, the surface of the cortex of both fragments is evenly flattened as a receptive bed for the graft. The graft is then spanned across the fibrous gap between the fragments and smoothly fitted to its bed. In the tibia, the graft is plated preferably to the lateral aspect of the bone. Good muscle covering should be sought in other bones. The metal plate should be of a solid rectangular form and of smooth surface. It is clamped directly on top of the graft, fixing it with screws in the conventional manner to compress evenly and gently the underlying transplant to its bed (fig. 3). In compound fractures, when an inflammatory reaction is likely to occur, the wound is dusted and all raw surfaces are rubbed with a half and half mixture of powdered sulfathiazole and sulfanilamide.

The retracted periosteum of the host fragments is brought as evenly as possible up over the slightly extended edges of the graft and even over the plate as much as possible in order to seal in and protect the graft. Plaster immobilization is applied. In four to six weeks regeneration of bone, in addition to the sustaining adequacy of the metal plate, affords passive and active motions in uncomplicated cases. The plate need not be removed after union, unless indicated because of irritation.

This method has been used in a series of 17 cases, 15 of which are analyzed in the accompanying table.

Plated Osteoperiosteal Bone Grafts: Analysis of Cases

Fractures	Age	Duration from Date of Fracture	Date Grafted	Condition of Local Field	Passive Motion Begun	Mobility and Function	Complications	Plate Removed	End Result
1. J. C. R.; compound comminuted left tibia and fibula, middle 3d	'49	15 mos.	10/25/40	Healed sinus in 3 mos.; 1" bone loss	8 wks.	6 mos.	None	No	Good union
2. C. M.; compound comminuted right tibia, lower 3d	39	8 mos.	11/10/39	Osteo, scars, sinuses	12 wks.	6 mos.	Persistent sinus	10 mos.	Good union
3. P. G. K.; comminuted tibia and fibula, lower 3d	41	5 mos.	3/12/41	Good	5 wks.	4 mos.	None	No	Good union
4. J. H. B.; compound comminuted tibia and fibula, lower 3d	62	2 mos.	9/ 6/40	Mild drainage	28 wks.	9 mos.	Union slow, slight drainage	No	Good union
5. K. B.; compound comminuted left tibia, upper 3d	26	26 mos.	1/12/40	Chr. osteo	16 wks.	5 mos.	Chronic osteo	No	Good union
6. A. M.; comminuted right tibia and fibula, lower 3d	39	2 mos.	3/26/40	Good	24 wks.	8 mos.	Infection and slough	4 mos.	Good union
7. D. V. H.; comminuted right tibia, lower 3d	35	2 mos.	11/ 2/40	Good	6 wks.	3 mos.	No	13 mos.	Good union
8. F. A. B.; compound comminuted right tibia and fibula, lower end	35	6 mos.	6/20/41	Scars	5 wks.	5 mos.	No	8 mos.	Good union
9. D. McF.; compound comminuted right tibia, lower 3d	21	3 yrs.	1/30/40	Scars and sinus	6 wks.	5 mos.	Persisting sinus	9 mos.	Good union
10. R. R. G.; comminuted lower end radius	34	5 mos.	9/ 9/41	Good	6 wks.	3 mos.	None	No	Good union
11. L. A. A.; compound right ulna, middle 3d	14	7½ mos.	6/ 7/40	Good	4 wks.	5 wks.	None	No	Good union
12. I. C. J.; mutilated radius and ulna, lower end	37	8 mos.	3/18/41	Severe scar, 1" loss of bone and sinuses	12 wks.	4 mos.	Persistent sinuses	7 mos.	Good union
13. J. P.; comminuted left radius and ulna, junction upper and middle 3d	32	11 mos.	9/19/39	Good	7 wks.	3 mos.	None	No	Good union
14. F. F.; compound comminuted right radius and ulna, middle 3d	32	3 mos.	1/23/42	Rough scars	.....	.....	None	No	Good union
15. D. A.; midshaft radius and ulna, right	28	5 wks.	1/ 6/42	Rough scars	4 wks.	.....	None	No	Good union

Union was obtained in all cases. Osteogenesis, as followed by x-ray examination, compared favorably in rapidity and quality with that which might have been expected with a full thickness graft. The intermediary tissue between the ununited fragments ossified with favorable rapidity, and it seemed unnecessary to remove it as is commonly practiced.

In case 6, the plate was removed at four months because of slough, but the graft remained uniformly adherent, and firm union of the fragments was obtained. In cases 1 and 5 there was 3/4 inch to 1 inch loss of bone substance. The intervening fibrous tissue was not removed but osteogenesis developed throughout the gap, with progressive firmness. In case 8, the lower fragments of the tibia were severely comminuted into the ankle joint, with very little firm bone to which the plate could be anchored. Case 12 presented a mutilated hand with severe scar tissue and 1 inch loss

3. Burrows, H. G.: Treatment of Ununited Fractures by Bone Graft Without Resection of the Bone Ends, Proc. Roy. Soc. Med. **33**: 157-160 (Dec.) 1939.

of bone in the lower end of the radius. Union was successful even though persistent sinuses were present.

Examination of the grafted region after removal of the plate has revealed bony union of the graft to its bed. The surface under the plate has been found to be living fibrous tissue of periosteal consistency.

Microscopic study of a section taken transversely through the graft and cortex of the fragment shows that the graft becomes adherent to the host bone with new vessels forming a cytogenetic relation between the new tissue introduced and the bone tissue in the neighborhood.

SUMMARY AND CONCLUSIONS

The advantages of a plated osteoperiosteal graft are:

1. The metal plate is very dependable.
2. The simpler procedure is more often justified in delayed union.
3. There is less violent trauma by bone sawing in obtaining and fitting the graft.
4. There is less bulk to cover up than in full thickness grafts.
5. It affords an earlier grafting operation on compound fractures with old scars and sinuses.
6. It renders earlier passive motion.
7. When reduction of the fragments is not necessary, the intermediary callus need not be removed.
8. Resulting osteogenesis compares favorably with that obtained with the full thickness graft.

605 North West Tenth Street.

ABSTRACT OF DISCUSSION

DR. LEO S. LUCAS, Portland, Ore.: The importance of retaining the periosteum on the bone graft is still a controversial point. In operating on dogs and using otogenous grafts with the periosteum retained, and others in which the periosteum was removed, Pollock concluded that no advantage is gained by the retention of the periosteum in bone grafting operations. It was his opinion that removal of the periosteum from the graft results in the production of a more active periosteum from the surrounding connective tissue and that the scarification of the surface in the removal of the periosteum liberated osteoblasts from the graft itself. It is my feeling that the most important factor is the preservation with as little trauma as possible of the periosteum at and surrounding the fragments to be grafted. Where possible, all soft tissues should be left intact in order to preserve the blood supply that is so important in the process of repair. I agree with Dr. McBride that, unless it is absolutely necessary to redress the fragments in order to obtain proper alinement, the fibrous tissue between the ends of the bone should not be disturbed, and this applies to any type of bone grafting procedure used. The ossification of these tissues is rapid during osteogenesis. Because of the difficulty of properly securing osteoperiosteal grafts, many of us have felt that the massive onlay or inlay grafts were superior. While the osteoperiosteal method may be sufficient to produce the necessary osteogenic material, this type of graft has been difficult to apply with proper fixation of the fragments, which is so important in the healing of an ununited fracture. Dr. McBride has shown the feasibility of using the graft to better advantage, insuring excellent fixation to the affected parts and the possibility of using it in early cases, in which the more extensive procedures might be accomplished with more risk. It offers a method that has been successful in his hands, is comparatively simple in application and conforms to good surgical principles.

DR. REXFORD L. DIVELEY, Kansas City, Mo.: We are indebted to Dr. McBride for this most interesting presentation. I can commend to you his exhibit in the Scientific Exhibit, in which he has most of the presented cases illustrated with plates. I was not impressed in the study of this exhibit with the fact that the periosteal graft is entirely responsible for the union or the osteogenesis. I was impressed, however, with the fact that the union takes place as the result of the fixation. Therefore it is my feeling, having seen many grafts being held by band and by wire and by other metallic pressure, that the massive onlay, or the massive inlay osteoperiosteal graft, carefully and firmly held by two or four metallic screws of the vitallium type, will not only give fixation but will also give certainly a great deal more osteogenesis than will the periosteal graft which is being hugged or crushed by a plate.

DR. EARL D. MCBRIDE, Oklahoma City: I purposely left out of this paper the various discussions that I knew might arise with regard to periosteum versus bone in osteogenesis. It is an old subject and we have heard it discussed many times. I agree with Dr. Diveley that the immobilization is an essential factor in this method. In the interim of different cases I have used a plate without the graft in two or three instances. I am impressed that they do not produce the same results as when I use the osteoperiosteal graft. As a matter of fact, I operated again in 1 case and used the osteoperiosteal graft because of failure of union. Consequently it is immaterial to me whether the improvement is due to the fixation or to the osteoperiosteal graft. There is 1 case in the exhibit in which I show that the graft has been fixed with screws alone, and the result is just as good as when I used the metal plate over the graft. So there is no argument in that respect. The point that I made about this entire discussion is that with the metal plate for fixation, which is absolutely dependable and which is not subject to absorption as is the cortical graft, together with the sulfonamide drugs which we now have, enables us to secure union in some of these chronically infected compound fractures that otherwise would be kept in a plaster or other immobilization for months and months. Now we can proceed to take the risk of surgery in nonunion of old compound fractures, with the confidence that we have the fragments fixed and that we can get the patient to respond to function much earlier. That holds true with delayed union. We usually put on casts and wait two or three months, then put on another cast, thinking that perhaps the forearm bone or humerus would finally unite, and we would wake up finally to find a stiff elbow or stiff fingers. Now, with a good fixation of the osteoperiosteal graft under the plate, I am able to remove immobilization much sooner with a better function of the elbow and fingers. So I have developed full confidence in this method and thought it worth while to present the method for your consideration just from these certain points of view and have purposely omitted arguments regarding the various controversies of bone graft versus periosteum and healing of bone tissue.

More or Less Continuously Bored.—The mode of life of the majority of American women married to men of average or better than average incomes is more deleterious to their physical and functional well-being than any except the extreme degrees of privation and drudgery. In the first place they have so little to do that they are more or less continuously bored; boredom leads to restlessness, restlessness to mental and nervous hypertension which expresses itself in functional neuroses, irritability, introspection and the expenditure of a tremendous excess of nervous energy in the performance of any physical or mental task. All of this leads to nervous fatigue and neurasthenia. The average woman who has driven her children to school, planned the day's menu, instructed her servants and repaired some trifling damage to her wardrobe must go to bed after lunch and rest before engaging in the arduous task of an afternoon at the bridge table. Knowing the exhaustion which attends the performance of such things, she feels that she cannot survive the exertion attendant on a game of golf or tennis, a swim, or a ride on horseback. As a result her muscles become flabby, fat accumulates, the general tonus is reduced to a minimum, the functional activities of the body are impaired and functional neuroses reign unopposed.—Cooke, Willard R.: Essentials of Gynecology, Philadelphia, J. B. Lippincott Company, 1943.

THE PLACENTAL TRANSMISSION OF PROTECTIVE ANTIBODIES AGAINST WHOOPING COUGH

BY INOCULATION OF THE PREGNANT MOTHER

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AND
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Whooping cough is the dread contagious disease of infancy. During the first two years of life it is the cause of more deaths than measles, diphtheria, poliomyelitis and scarlet fever combined.[1] Against the latter diseases the baby usually is born with a passive immunity transmitted by the mother through the placenta.[2] Since this is a passive immunity it endures for only approximately six months. Such does not seem to be the case with whooping cough.

Pediatrists not infrequently encounter cases of whooping cough in early infancy. The figures on the incidence of whooping cough in the infant vary from 8 to 18 per cent of the total incidence of whooping cough at all ages.[3] This is clinical evidence of the frequent lack of immunity in the newborn.[4] At present there are few data on the humoral immunity of the average adult against whooping cough. This is explainable because it is only in the last few years that proper immunologic tests for whooping cough have been devised. Without proper and sufficient data as to the immunity of the adult female, immunity of the newborn baby against whooping cough in respect both to frequency and to degree can be only conjectured. Thus Holt and McIntosh [3] state that natural susceptibility to whooping cough seems to be equal at all ages and little or no immunity is conveyed in utero, regardless of whether or not the mother is immune. Some believe that natural immunity to pertussis does not exist and that no natural immunity is transmitted from mother to child.[5] On the other hand, Knoepfelmacher,[6] in Pfaundler and Schlossmann's system, states that a congenital immunity to whooping cough can be accepted derived from previous pertussis of the mother. Sauer [1] speaks little of this subject in Brennemann's System of Pediatrics except for quoting Bordet as believing in transient congenital immunity. It seems that there is no unanimity of opinion on this subject.

The human placenta is of the hemochorionic type in which a single layer of chorionic and endothelial cells separates the fetal from the maternal blood.[7] To all intents and purposes, there is here a semipermeable membrane obeying the physicochemical laws of semipermeable membranes.[8] The size of the molecules determines what passes across and what fails to pass the placental barrier.[9] In general, antibodies and not antigens are able to filter through from the mother's blood to the baby's blood.[9] Thus it has been demonstrated that the titer of diphtheria antitoxin is approximately the same in the mother's blood, the cord blood and the placental blood.[10] The same holds true of the other antitoxins such as tetanus.[11] It is well known that the blood group of the baby may not be well established for several weeks because of the passage of the mother's blood agglutinins into the fetal blood.[12] Immunity against scarlet fever, measles and poliomyelitis for the first half of the infant's life is conferred on the baby through the antibodies of the mother's blood by way of the placenta. The newborn baby has also been shown to have, at least in many instances, antistreptolysins,[13] antistaphylolysins and other bacterial antibodies similarly passively transmitted by the mother.[14] The same probably holds true of antibodies against all organisms which are already preformed in the mother's blood during pregnancy.[15]

According to Needham, antigens as a class, unlike antibodies, do not pass through the placental barrier. There are certain exceptions, however, for typhoid, malaria, pneumonia [16] and rheumatic fever, among other diseases,[17] have been described in newborn babies. In these instances we are dealing with a disease process which probably alters the capillaries on both sides of the placenta, effecting an abnormal exchange. Ratner

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The social service department and the nurses of the hospital aided in this investigation with willing cooperation and untiring efforts.
Read before the Section on Pediatrics at the Ninety-Third Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1942.

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and his colleagues,[18] however, have presented evidence that allergenic antigens can traverse the normal placentral membrane and actively induce antibody production. It may be possible, then, for the antigen in the mother's blood to be transmitted to the fetal blood, in which event active immunity will result as well as passive immunity.

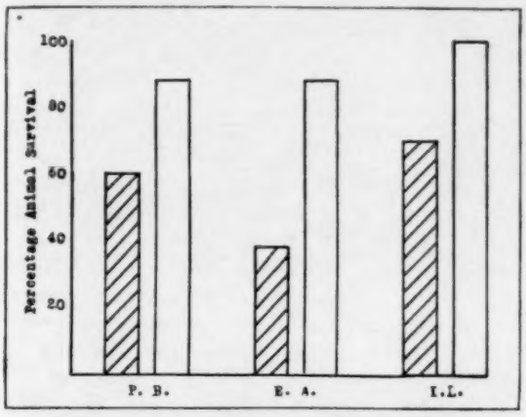

Chart 1.—Showing close correlation of protective titers. The baby's titer is higher in each instance. The shaded column indicates the mother's protective antibodies and the unshaded column the baby's protective antibodies.

As shown earlier, whooping cough in infants is accompanied by a high mortality.[19] It is for this reason—this apparent lack of immunity of any nature against whooping cough—that efforts have previously been made actively to immunize young infants, but the results have been disappointing, for immunity did not result from inoculations with the Sauer vaccine in young infants in the dosage of 80 billion, beginning at 1 month to 2 months of age.[20] The young infant apparently has not the capacity to form antibodies against the whooping cough bacillus antigens. In fact, the most modern opinion is that the very young infant is a poor antibody producer against all antigens.[21] Young infants inoculated with the Sauer vaccine, unlike older infants similarly inoculated, contracted whooping cough on exposure as frequently as those uninoculated. Since active immunity has not been successful in these young infants at this most dangerous age period for whooping cough, the idea came to one of us (P. C.) to create active immunity in the pregnant mother in the last trimester of pregnancy, hoping that the antibodies so formed would pass the placental barrier and induce passive immunity in the baby.

Our idea was to inoculate the pregnant mother with a potent pertussis bacillus vaccine in the fifth or sixth month of pregnancy. The vaccine we chose is one prepared by Mishulow of the New York Laboratories, which has proved potency and which we have used in previous work with satisfactory results.[22] Our plan was to administer the vaccine at intervals of two weeks for six injections, totaling 150 billion organisms. This timing was chosen because it was shown by Mishulow and Wilkes and their associates [23] that the highest titer of protective antibodies was found in the blood of vaccinated children approximately two months after vaccination. In order to minimize reactions, the first dose was 10 billion, the second 20 billion and the other four doses 30 billion, given subcutaneously in one or both arms. In many instances the full dose of 150 billion organisms was not administered either because of the tardy initial presentation of the pregnant mother or because absence from the clinic threw off the timing of our injections, which were aimed to terminate a month or two before the expected date of delivery. At times deliveries occurred earlier than the calculated date, upsetting our time table, but delivery beyond the expected date had little effect on the results.

The reactions of the inoculated mothers were less severe than those obtained when children are inoculated with the Sauer vaccine. Elevation of temperature was encountered only twice in our first hundred cases. Soreness and tenderness in the inoculated area was a feature in almost every case. A persisting lump, sometimes for days, was a common occurrence. There were times when the arms were so sore that the woman could not use them for two or three days. The local reactions were very similar to those generally encountered in children, but the systemic reactions were less frequent and far less noticeable. There were no abscesses and no persistent nodules. It was apparent to us that the inoculations had no effect on the pregnancy or delivery. There were no premature births or postpartum complications which could be attributed to the inoculations. The babies thrived and did as well in the hospital as did the babies of uninoculated mothers serving as a control series.

Before the injections were begun 10 cc. of blood was taken for the titration of antibodies, which also served the purpose of a control measure. These data will be included in a separate article by Mishulow and her co-workers. At the time of delivery 10 to 15 cc. of blood was taken from the mother and the umbilical cord, which represents the baby's blood. These bloods were titrated for immune bodies. At intervals of six to nine months equal amounts were to be taken from mother and baby for a retitration of immune bodies to enable us to study the duration of any immunity

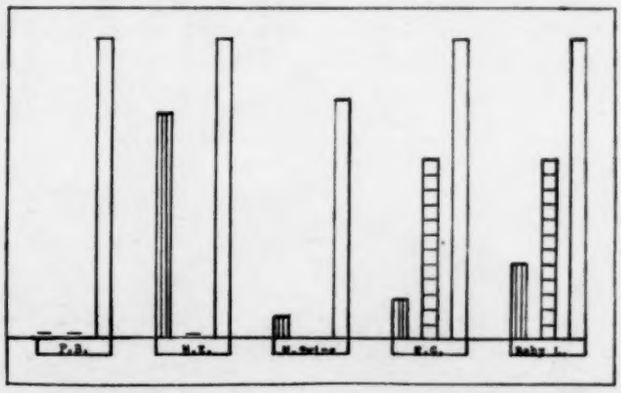

Chart 2.—Illustrating lack of correlation of protective antibodies with agglutinins and complement fixation. Equivalent heights for agglutination 1/200 is indicated by vertical shading, complement fixation 0.01 cc. by horizontal shading and protective antibodies 100 per cent by unshaded column.

18. Ratner, B.; Jackson, H. C., and Gruehl, L. H.: Transmission of Protein Hypersensitiveness from Mother to Offspring: V. Active Sensitization in Utero, J. Immunol. **14**: 303 (Nov.) 1927.

19. Sauer.[1] Bulletin of the Department of Health of New York City.[4] Holt and McIntosh.[3] Zinsser, Enders and Fothergill.[5] Knoepfelmacher.[6] Top.[8]

20. Sauer, L. W.: The Age Factor in the Active Immunization Against Whooping Cough, Am. J. Path. **17**: 719 (Sept.) 1941. Municipal Control of Whooping Cough, Department of Health Circular 155, State of Illinois, March 1, 1941.

21. Sabin, A.: Constitutional Barriers to the Involvement of the Nervous System by Certain Viruses, with Special Reference to the Role of Nutrition, J. Pediat. **19**: 596 (Nov.) 1941. Mishulow, Lucy: Personal communication to the author. Bennholdt.[27]

22. Lapin, J. H.; Cohen, Philip, and Weichsel, Manfred: Prophylactic Vaccination Against Whooping Cough, Arch. Pediat. **56**: 590 (Sept.) 1939. Cohen, Philip; Weichsel, Manfred, and Lapin, J. H.: A Comparative Study of Therapeutic Agents in Whooping Cough, J. Pediat. **16**: 30 (Jan.) 1940.

23. Mishulow, Lucy, and others: Stimulation of Pertussis Protective Antibodies by Vaccination, Am. J. Dis. Child. **62**: 1205 (Dec.) 1941.

actively or passively induced. A group of uninoculated mothers and their babies were similarly bled and their blood quantitated for the same immune bodies. These served as a control group.

The specific immune bodies studied [24] in this investigation were agglutinins, complement fixing antibodies and protective antibodies. The laboratory tests were carried out by Miss Mishulow and her assistants at the New York City department of health. Her method of testing for these antibodies was the same she used in her studies of the immunologic response in cases of pertussis and in vaccinated children.[25]

TABLE 1.—*Study of Immunity of Mothers Before Vaccination Against Whooping Cough*

Name	Date, 1941	Age	History of Whooping Cough	Agglutination	Complement Fixation	Mouse Protection	
						Survived	per Cent
H. R.	3/27	30	?	0	0	0/9	0
D. B.	4/ 1	27	?	25	0	3/6	50
P. B.	4/ 8	32	Negative	0	0	0/8	0
M. E.	4/16	23	Negative	0	0	2/10	20
F. G.	3/13	24	Negative	0	>0.02	1/8	12.5
E. G.	5/22	29	Negative	0	0	1/10	10
A. M.	5/14	33	Negative	0	0	0/10	0
I. S.	4/ 1	27	Negative	0	0	0/6	0
A. T.	3/27	30	Negative	0	0	10/10	100
P. B.	5/ 1	24	Positive	0	0	9/10	90
R. W.	5/14	26	Negative	75	0.02	4/10	40
S. K.	4/ 3	37	?	0	<0.01	0/10	0
R. W.	5/13	24	?	0	>0.02	2/9	22.2
E. A.	5/13	19	Positive	0	0	0/6	0
R. M.	5/27	19	Negative	50	0	0/9	0
G. S.	5/22	22	?	0	0	1/9	11
L. O.	6/26	25	?	0	0	1/9	11
M. S.	6/10	29	Negative	0	0	4/7	57
G. B.	6/26	22	Positive	50	0	5/9	55.5
V. S.	6/ 4	32	Negative	0	0	7/10	70
C. K.	5/21	31	?	0	0	6/9	66.6
H. L.	5/21	22	?	0	0	3/9	33.3
F. A.	5/21	23	?	0	0	0/8	0
E. B.	6/17	22	Negative	0	0	1/10	10
M. V.	5/20	33	?	0	0	4/9	44.4
S. S.	7/ 3	36	Negative	0	0	0/10	0
I. L.	5/29	32	?	0	0	0/9	0
D. W.	6/12	26	?	0	0	0/10	0
A. S.	5/28	30	?	0	0	1/9	11

In the test for protective antibodies groups of mice were inoculated with 0.2 cc. of the serum intramuscularly nineteen to twenty hours previous to the intraperitoneal injection of a multiple killing dose of virulent Hemophilus pertussis suspended in 1 cc. of 4 per cent mucin. At each test similar groups of mice were inoculated with a known positive serum and with the test doses of the culture without serum; these served as controls on the validity of the test. The serum was considered positive for protective antibodies when 30 per cent or more of the mice survived the seven to eight days. All mice that died during the period of observation were examined post mortem in order to determine the presence of another infection; in the event of such a finding the mouse was eliminated from the calculations. In all mice that were inoculated with the culture H. pertussis was recovered from the heart's blood in the first four days of the test unless the plates were contaminated by other organisms that invaded the blood post mortem when the mice died during the night.

TABLE 2.—*Study of Immunity of Unvaccinated Mothers and Infants at Time of Delivery*

Vaccine Dose	Whooping Cough	Age	Tested	Agglutination	Complement Fixation	Mouse Protection	
						Survived	Per Cent
0	Neg.	22	Mother on delivery	0	0	1/8	12.5
			Baby at birth.....	0	0	2/9	22.2
	Neg.	22	Mother on delivery	0	0	0/8	0
			Baby at birth.....	0	0	0/5	0
	Neg.	19	Mother on delivery	0	0	0/10	0
			Baby at birth.....	0	0	0/10	0

The agglutination results were recorded in terms of the highest dilution of the serum that showed distinctly visible clumps. Indistinct or no agglutination in 1:10 dilution of the serum was recorded as negative. Complement fixation was recorded in terms of the smallest amount of the serum that gave complement fixation under standard conditions. Incomplete or no fixation in 0.02 cc. of the serum was recorded as negative.

Because agglutinins and complement fixing antibodies are not necessarily correlated with immunity,[26] special attention was given to the study of protective antibodies. Investigation of other tests which have been used to appraise immunity in whooping cough, such as cutaneous tests,[27] opsonophagocytosis studies,[28] the antitoxin content of the serum [29] and the protection of mice by the serum against a multiple lethal dose of live whooping cough bacilli inoculated into the respiratory tract,[30] led us to choose the mouse protection test as the most searching and convincing available.[31] This test is similar to the testing of antipneumococcus and antimeningococcus serums in mice which have been inoculated intraperitoneally with live pneumococci or meningococci.

TABLE 3.—*Pertussis Antibodies in Infants of Unvaccinated Mothers—Tested at Birth*

Case	Name	Bled	Mother's History of Pertussis in Childhood	Result			
				Agglutination	Complement Fixation	Mouse Protection	
						Survived	Protected, per Cent
1	Baby F.	2/28/42	Positive	0	0	2/6*	?
2	Baby L.	2/27/42	Positive	0	0	5/10	50
3	Baby W.	2/28/42	Positive	0	0	1/10	0
4	Baby C.	3/ 1/42	Negative	0	0	3/10	30
5	Baby G.	2/27/42	Doubtful	0	0	0/10	0
6	Baby Q.	2/27/42	Negative	0	0	0/ 9	0

* One mouse ill at the end of the test.

Agglutination tests were recorded in a figure which indicated the dilution of the serum that yielded distinct clumps. The figure under the column of complement

24. The laboratory immunologic studies were entirely performed for us by Miss Mishulow and her co-workers at the New York City Bureau of Laboratories by permission of Dr. Ralph Muckenfuss.

25. Mishulow, Lucy; Klein, I. F.; Liss, Mildred M., and Leifer, Lilliam: Protection of Mice Against H. Pertussis by Serum Comparison of Protection with Agglutination, J. Immunol. **37:** 17 (July) 1939. Mishulow and others.[32]

26. Schwartzman, Gregory: Personal communication to the authors. Mishulow, Klein, Liss and Leifer.[25]

27. Weichsel, Manfred; Rubin, H. J.; Cohen, Philip, and Lapin, J. H.: Intracutaneous Tests with Pertussis "Toxin" and Complement Fixation Tests in Whooping Cough, Am. J. Dis. Child. **60:** 862 (Oct.) 1940.

28. Kendrick, P.; Gibbs, J., and Sprick, M.: The Opsonocytophagic Test in the Study of Pertussis, J. Infect. Dis. **60:** 302 (May-June) 1937. Bradford, W. L., and Slavin, B.: The Opsonocytophagic Reaction of the Blood in Pertussis, J. Clin. Investigation **16:** 825 (Sept.) 1937.

29. Flosdorf, E. W.; Bondi, A., and Dozois, T. F.: Studies with Pertussis Antigenicity of the Toxin and Reaction to Other Cellular Components from the Several Phases, J. Immunol. **42:** 133 (Oct.) 1941. Flosdorf, E. W.; McGuiness, A. C.; Kimball, H. C., and Armstrong, J. G.: Studies with H. Pertussis Preparation and Assay of Hyperimmune Serum, J. Pediat. **19:** 638 (Nov.) 1941. Evans, D. G., and Maitland, H. B.: Failure of Whooping Cough Sera to Neutralize Pertussis Toxin, J. Path. & Bact. **48:** 465 (March) 1939.

30. Bradford, W. L.: Experimental Infection in the Mouse by Intratracheal Inoculation with H. Pertussis, Am. J. Path. **14:** 377 (May) 1938. Burnet, F. M., and Timmins, C.: Experimental Infection with H. Pertussis in the Mouse by Intranasal Inoculation, Brit. J. Exper. Path. **18:** 83 (April) 1937.

31. Silverthorne, Nelles: Experimental Infection with H. Pertussis and Protection Tests in Mice, Canad. J. Pub. Health **29:** 233 (May) 1938. Miller, J. J., Jr., and Silverberg, R. J.: Pertussis Vaccines: The Effect of Washing and the Use of Mouse Protection Tests, J. Infect. Dis. **65:** 16 (July-Aug.) 1939. Mishulow, Klein, Liss and Liefer.[25] Powell and Jameson.[44]

fixation indicates the amount of serum needed to produce a 4 plus complement fixation reaction. If 0.02 cc. of serum or less was needed, the test was considered positive. In the mouse protection tests, in almost every case 10 mice were used for each test, but owing to unforeseen and inevitable incidental fatalities this number was at times reduced. If the amount of serum was control combinations. The unvaccinated mothers and their babies showed no agglutinins or complement fixing antibodies and little or no protective antibodies against whooping cough. As additional control cases, the cord blood of 6 babies of uninoculated mothers were examined for the same antibodies but their mothers' bloods were not similarly studied. Three of these

TABLE 4.—*Placental Transmission of Pertussis Antibodies to the Newborn*

Lab. No.	Name	Age	Vaccine Dose, Billions	Tested: Date	Tested: Specimen Taken on Day of Delivery	Tested: Period After Vaccination	Result: Agglutination	Result: Mouse Protection: Complement Fixation	Result: Mouse Protection: Survived	Result: Mouse Protection: Protected, per Cent
C-1	H. R.	30	90	6/ 1/41	Mother	1½ wks.	350	0.009	8/10	80
				6/ 1/41	Infant	.....	75	0.01	10/10	100
C-2	D. B.	27	150	7/ 1/41	Mother	2 wks.	650	0.009	8/ 9	88.8
				7/ 1/41	Infant	.....	800	0.004	10/10	100
C-3	P. B.	32	150	8/10/41	Mother	7½ wks.	0	0.02	6/10	60
				8/10/41	Infant	.....	0	0	8/ 9	88.8
C-5	M. E.	23	150	8/ 1/41	Mother	5 wks.	150	0	8/ 8	100
				8/ 1/41	Infant	.....	1,000	0	6/ 6	100
C-6	F. G.	24	150	7/21/41	Mother	6½ wks.	75	0.009	8/10	80
				7/21/41	Infant	.....	75	0	8/ 9	88.8
C-9	E. G.	29	120	7/21/41	Mother	4 wks.	25	0.02	9/ 9	100
				7/21/41	Infant	.....	37	0.01	7/ 7	100
C-12	A. M.	33	90	7/ 3/41	Mother	1 wk.	950	0.02	7/ 9	77.7
				7/ 3/41	Infant 1	.....	0	0	8/10	80
				7/ 3/41	Infant 2	.....	25	0	7/ 8	87.5
C-14	I. S.	25	150	7/30/41	Mother	6 wks.	75	0	6/ 9	66.6
				7/30/41	Infant	.....	100	0	5/ 8	62.5
C-15	A. T.	30	120	6/30/41	Mother	2½ wks.	350	0.02	10/10	100
				6/30/41	Infant	.....	150	0.009	9/10	90
C-18	P. B.	24	150	8/14/41	Mother	5 wks.	700	0.007	8/ 9	88.8
				8/15/41	Infant	.....	200	0.004	9/10	90
C-19	R. W.	26	120	8/ 6/41	Mother	1 wk.	300	0.007	10/10	100
				8/ 6/41	Infant	.....	8,000+	0.005	5/ 6	83.3
C-20	S. K.	37	120	8/ 7/41	Mother	4 wks.	30	0.01	8/ 9	88.8
				8/ 7/41	Infant	.....	0	0.01	9/10	90
C-21	R. We.	24	150	8/31/41	Mother	4½ wks.	250	0.02	8/ 8	100
				8/31/41	Infant	.....	150	0.01	8/10	80
C-25	E. A.	19	150	8/25/41	Mother	5 wks.	450	0.01	3/ 8	37.5
				8/25/41	Infant	.....	500	0.005	8/ 9	88.8
C-26	R. M.	19	120	9/ 2/41	Mother	5 wks.	600	0.02	7/ 8	87.5
				9/ 2/41	Infant	.....	700	0.008	10/10	100
C-30	G. S.	22	150	9/11/41	Mother	4 wks.	900	0.007	7/ 9	77.7
				9/11/41	Infant	.....	900	0.005	8/ 8	100
C-32	M. S.	29	150	9/14/41	Mother	3½ wks.	600	0.006	10/10	100
				9/14/41	Infant	.....	300	0.005	10/10	100
C-33	G. B.	22	150	9/24/41	Mother	3 wks.	900	0.02	9/10	90
				9/24/41	Infant	.....	600	0.007	7/ 7	100
C-34	V. S.	32	150	9/17/41	Mother	5 wks.	800	0.006	6/ 7	85.5
				9/17/41	Infant	.....	400	0.003	5/ 5	100
C-35	C. K.	31	140	9/17/41	Mother	7 wks.	300	0.01	9/10	90
				9/17/41	Infant	.....	100	0.01	N. T.†	..
C-36	H. L.	22	150	9/17/41	Mother	6 wks.	250	0.01	7/ 9	77.7
				9/17/41	Infant	.....	0	0.01	N. T.	..
C-37	F. A.	23	150	9/29/41	Mother	3½ wks.	200	0	8/10	80
				9/29/41	Infant	.....	25	0.02	8/10	80
C-38	E. B.	22	150	9/24/41	Mother	4 wks.	200	0.02	8/ 8	100
				9/24/41	Infant	.....	0	0.01	9/10	90
C-39	M. V.	33	120	9/22/41	Mother	10 wks.	800	0.02	10/10	100
				9/22/41	Infant	.....	800	0.009	10/10	100
C-40	S. S.	36	120	9/25/41	Mother	4 wks.	25	0	8/ 8	100
				9/25/41	Infant	.....	25	0	10/10	100
C-41	I. L.	32	150	10/ 7/41	Mother*	8½ wks.	50	0.02	7/10	70
				8/28/41	Infant	.....	50	0.02	6/ 6	100
C-42	D. W.	26	120	9/ 4/41	Mother	4 wks.	25	0	6/10	60
				9/ 4/41	Infant	.....	50	0	7/10	70
C-43	A. S.	30	150	10/ 9/41	Mother*	9 wks.	100	0	4/10	40
				9/20/41	Infant	.....	25	0.02	5/10	50
C-44	Mrs. W.	33	...	.....	Mother	.....	6,400	0.009	8/ 8	100
				.....	Infant	.....	9,600	0.01	10/10	100

* This woman was tested after delivery.

† N. T. = not tested; insufficient serum.

inadequate, 5 or more mice were employed. The results of these tests are reported in a fractional form; thus 0/9 indicates that 9 animals were used and none survived; 8/10 indicates that 8 out of 10 animals survived. The numerator of the fraction signifies the number of animals that survived and the denominator signifies the number of animals that were used.

Our intention was to use 10 uninoculated women and their infants as control cases. Unfortunately a wave of incidental infection killed most of the animals used for this purpose so that we were left with only three mothers gave a history of whooping cough in their childhood and the other 3 had a doubtful or negative history of previous pertussis. Of these 6 babies 1 had a fair amount of protective antibodies, 1 had a good titer of such antibodies and 1 had questionable protection. All these bloods revealed no agglutinins or complement fixing antibodies. Thus of 9 babies of uninoculated mothers, 2 or 3 showed some degree of protective antibodies (none with a really high titer) and none of their serums showed the presence of the other antibodies tested for.

We consider protection excellent when the great majority of the mice are protected by the serum. We consider protection good when close to half of the animals are saved by serum. Protection is fair when 30 per cent of the animals survive. Twenty-nine women have thus far been selected for the immunologic studies from a group of 167 women inoculated with the vaccine in doses from 80 to 150 billion. By these standards of immunity, of 29 cases 27 showed a very high titer, all definitely positive results. Of 27 babies tested, including 1 set of twins, the titers were equally high. In the case of E. A. and P. B., the babies had a higher titer than the mother. The babies' figures seemed to indicate a slightly higher titer than the mothers'. This may or may not be significant.

The agglutination and complement fixation reactions did not exactly correspond with the titers of protective antibodies. Thus the serums of 8 subjects were poor in the former antibodies yet yielded high protection. The twin babies, who had high protective antibodies, had little or none of the other antibodies tested. This is in keeping with previous work done on this subject.[25]

The tests were performed at intervals of from one to eight weeks after vaccination. We have some patients with an even longer interval after the last inoculation, but their serums have not yet been studied. The length of the interval seemed to make no difference in the height of immune bodies of the mother and the newborn baby. Whether it will affect the duration and the persistence of the antibodies is a matter for future study. The same probably holds true of the dosage. Although almost all of our patients were vaccinated with 120 to 150 billion organisms, some were vaccinated with only 80 to 90 billion. One woman vaccinated with 80 billion and 2 with 90 billion yielded as high a protective titer as those inoculated with the larger doses. Whether these antibodies will persist as long as in those cases in which the smaller dosage was given is questionable. The ages of our group of women varied from 19 to 36 years of age. The age factor and multiparity seemed not to play a role in the production of immune bodies. The previous history of whooping cough seemed not to play a role in the production of antibodies. Only 3 of the 29 women were sure that they had whooping cough; about a third were doubtful. There was no correlation between their initial titer of antibodies and the antibodies formed by vaccination. There was no difference in the data of this group and of the group who were certain that they had never had whooping cough.

RESULTS AND COMMENT

As far back as 1879 attempts have been made to immunize a newborn baby by inoculation of the pregnant mother against a specific disease.[32] In the case of syphilis, the inoculation of the pregnant mother to prevent or cure congenital syphilis is a universal measure.[33] Lichty, Slavin and Bradford[34] attempted, as they put it, to increase resistance against pertussis in newborn infants by immunizing the mother during pregnancy. They confessed their failure. An analysis of the data revealed the following facts: The injections were given at two week intervals in the last six weeks of pregnancy. The total dose administered was 20 to 25 billion. Thus the dose was inadequate and too late for antibody formation which reaches its climax between one and two months after the last inoculation. The test for immunity which they employed, cytophagocytosis of the blood, has distinct limitations and has been abandoned by them in favor of mouse tests.[35] Their figures showed no increase in cytophagocytosis of the inoculated mother's blood. Granting the validity of the test, they found no increased immunity in the mother, so that there were no antibodies transferable to the baby through the placenta. In rabbits it has been proved, as in babies, that the very young rabbit could not be immunized against pertussis,[36] but by the inoculation of pregnant rabbits antibodies were formed which were transmitted to the newborn rabbit.[37] This would seem to be the animal counterpart and confirmation of our work.

In a recent article it was found with the opsonocytophagic test,[38] that there was a correlation in the opsonizing power of mothers and their infants. This has previously been suggested by Bradford and Slavin;[28] yet Kendrick, Gibbs and Sprick,[28] with the same test, reported that the blood of newborn infants has virtually no phagocytic powers and is not correlated with the mother's reactions. Rambar and his co-workers[38] found that in a large series of premature infants there is a strong reaction up to 2 months of age and then a decline, suggesting a placental transfer of circulating antibodies against whooping cough. Our work is more in agreement with the latter findings. We have found that when a mother has a definite titer of antibodies against whooping cough she transmits it to the baby in about the same titer. This was true of 100 per cent of our series after the mothers had been inoculated with a sizeable dose of vaccine during the last trimester of pregnancy.

Mishulow and her co-workers[39] found that 15.2 per cent of children and adults who had a negative history of pertussis had pertussis protective antibodies. They also found in a study of the preimmunization bleedings of women who were studied in this investigation that 31.2 per cent of them had these antibodies before they were vaccinated.[40] If we can assume, as would seem likely from our investigations, that these antibodies are transmitted from the pregnant adult to the baby, a definite proportion of babies may be born with some immunity against whooping cough. In the few cases that we have studied we have found on two or three occasions protective antibodies in the cord blood, but more investigations are needed to establish percentage incidence. In the meantime, it may be conservative to assume that a small percentage of babies, perhaps 15 per cent to 25 per cent, are born with passive immunity of uncertain duration but that the great majority have no protection against whooping cough. This fits in well with known clinical facts. Sauer's[1] and Top's[3] studies point to no great difference in susceptibility between the younger and the older infants if vaccination has not been performed. This is an important point, for the high mortality in the susceptible infants, which is a

32. Burckhardt, A. E.: Zur intrauterinen Vaccination, Deutsches Arch. f. klin. Med. **24**: 506, 1879.

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40. Mishulow, Lucy, and others, to be published.

common pediatric experience, was the fact which led us to attempt our prophylactic measure. The need for the protection of the infant against this dread disease is therefore nearly as great as was anticipated.

Recently a similar investigation was performed with diphtheria immunization.[41] Diphtheria lends itself readily to such studies because technics are available for the titration of antitoxin in the blood and there is a good cutaneous test as an index of immunity, namely the Schick test. With such methods past studies of diphtheria have shown a high correlation between the antitoxin content of the bloods of the mothers and their babies.[42] Such studies have revealed also that in large cities close to 90 per cent of mothers are immune to diphtheria, as are their babies.[43] Yet in the recent Chicago study of this subject more than 50 per cent of mothers at term were found to be Schick positive and to have an antitoxin content of blood inadequate to constitute an effective immunity against diphtheria. Because of this, the pregnant mothers were inoculated with diphtheria toxoid in the latter part of pregnancy. There resulted a close correlation between the increased antitoxin titer of the mother's blood, the cord blood and the infant's blood. If this work is verified by further studies, previous estimates of diphtheria immunity in the newborn will have to be revised and measures taken to protect the newborn baby against diphtheria. In a discussion of this paper, mention was made of the great need for a similar project to confer protection on the newborn baby against dangerous whooping cough. Since our work was already in progress, this was an interesting statement to us.

Does the presence of a high titer of protective antibodies in serum signify definite immunity in the human being against whooping cough? While this question cannot be categorically answered in the affirmative, there is much evidence to make this a logical assumption. The convalescent from whooping cough, in most instances, has a serum rich in protective antibodies.[44] After proper immunization with vaccines, the serum becomes rich in protective antibodies.[45] It has been demonstrated that this hyperimmune serum as well as convalescent serum is of great value in preventing whooping cough in unimmunized contacts[46] and is even of great aid if employed in suitable doses in the treatment of whooping cough itself.[47] Small amounts of such serums are remarkably effective in protecting animals against what is otherwise an overwhelmingly fatal infection from live pertussis bacilli injected intraperitoneally.[48] There is ample evidence in the literature now that individuals inoculated with suitable doses of a proper vaccine have a high degree of immunity against whooping cough.[49] Correlated with this immunity is the presence of protective antibodies in the blood of the vaccinated individuals.[50] These facts all point to the conclusion that protective antibodies, if not the sole mechanism of immunity against whooping cough, are a reliable index of immunity. The question can be answered finally only by a follow-up study of the fate of infants and children, vaccinated and unvaccinated, with and without protective antibodies, when actually exposed to intimate contact with whooping cough. We are doing this now, but this is an investigation which will take years and large numbers of cases before an unequivocal answer can be obtained.

What is the nature of this immunity and how long will it last? Judging by the close correlation of the titers between mothers and babies, this transplacental immunity is most likely of a passive nature. On the other hand, the higher titer in a few babies may indicate a passage of antigen, conferring added active immunity on the baby. It must be recalled that there have been several instances in the literature of antigens passing the placental barrier.[51] This is not merely an academic question, for passive immunity will be of short duration—from a few weeks to a few months—while active immunity will last for a much longer time. In addition, boosting doses, which has proved to be a successful technic,[52] is more apt to be of value if the immunity has an active factor. Thus, if one finds that at 6 months of age the baby is rapidly losing his immunity, a further injection of 30 billion bacilli can be given and the dose repeated every six months or yearly. This work we have already begun.

CONCLUSIONS

1. Since whooping cough is such a serious disease in young infants, an attempt was made to immunize newborn babies by vaccinating the pregnant mother with a whooping cough vaccine in the last trimester of pregnancy.

2. In this we have been successful, judging by the presence of immune bodies.

3. The total dose we advise is 150 billion, given at intervals of two weeks beginning at the sixth month of pregnancy. The last injection is to be given six weeks to two months before term.

4. The systemic reactions after vaccination were few and not severe. The local reactions were common, at times very painful, not serious and sometimes lasted as long as a few days.

5. There were no discernible effects on the course of pregnancy, on delivery or on the baby. There were no miscarriages or premature births that could be attributed to the procedure.

6. In 29 instances immunologic studies were performed on the serums of babies and mothers after

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vaccination, with particular emphasis on mouse protection tests.

7. In every case the protective titer was raised to a very high level, which was almost quantitatively transmitted to the baby.

8. We have reason to believe from this evidence that these babies were born with immunity against whooping cough.

9. Further studies are being made as to the duration and persistence of these antibodies in both babies and mothers.

10. A small control series of 9 babies of uninoculated mothers were studied immunologically. None revealed agglutinins or complement fixing antibodies, but 2 or perhaps 3 yielded a fair titer of protective antibodies.

11. There is, then, some evidence that a definite percentage, perhaps between 15 and 25, of babies may be born with some immunity against whooping cough.

12. A biologic follow-up is being carried out to correlate the exposure to and the incidence of whooping cough in the inoculated group as compared with an equally large uninoculated group.

1175 Park Avenue—993 Park Avenue.

ABSTRACT OF DISCUSSION

DR. SAMUEL J. SCADRON, New York: Our idea was to inoculate the pregnant mother with a potent pertussis bacillus vaccine in the fifth or sixth month of pregnancy. I want to say a word with regard to the effect of this vaccine on the pregnant mother. We have studied only 29 cases immunologically but we have inoculated 167 mothers; in other words, we immunized 167 mothers. There were 90 multiparas and 77 primiparas. The average dose injected was 120 to 150 billion. Previous history of whooping cough in our patients was unknown to 15. A hundred had whooping cough in early childhood. There were 37 positive histories and 15 were doubtful. The types of delivery were not affected by the pertussis vaccine. We had 2 cases of toxemia, which I did not attribute to the injection of the vaccine. I myself watched these cases ante partum and during the postpartum period and found that the vaccine was absolutely innocuous. But the mothers were protected against whooping cough, and this most likely had a beneficial effect on the babies.

DR. WILLIAM L. BRADFORD, Rochester, N. Y.: Several years ago I was interested in the placental transmission of antibodies in pertussis as tested by the opsonocytophagic reaction of the blood. It was observed that in certain newborn infants a high titer existed. When this was true the mother almost always possessed a high titer likewise. Dr. Lichty and Mrs. Slavin were generally able to increase the titer of the baby by injecting the pregnant mother with vaccine during the last trimester of pregnancy. This work was not extended because it did not seem, at the time, to be of practicable application. By using the mouse protective method, Drs. Cohen and Scadron apparently have obtained equally good or better results, suggesting that the opsonocytophagic reaction and the mouse protective antibody may give comparable results as methods of testing humoral immunity to pertussis.

DR. PHILIP COHEN, New York: Owing to limitation of time, I could not go into the presumptive proofs that the protective antibodies in the serums which were induced by inoculation of the pregnant mother conferred immunity. I did mention some of the evidence which Dr. Bradford just presented and some additional evidence in the literature, wherein protective antibodies, if not the chief factor in immunity, is a reliable index of immunity in the newborn baby and in any one who has those protective antibodies. I might add that 29 cases are not a small group to be studied because the number of mice we used in these tests amounted to at least 2,000. At least 30 mice are required for each case, so that the technic is prodigious. Dr. Muckenfuss and Miss Mishulow did this work, without which nothing could have been accomplished.

REPAIR OF TRAUMATIC GAPS IN NERVES

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BALTIMORE

The requirements for functional regeneration of divided nerves are complex and exacting. This is at once evident when it is realized that under the most favorable conditions of repair, by means of primary suture of accurately approximated stumps, the original function of the nerve is never completely restored. The many problems and clinical difficulties involved in connection with nerve injuries have been the subject of numerous investigations and publications, almost two thousand being cited by Pollock and Davis.[1] Quite recently the experimental data and theoretical considerations on the long investigated problems of nerve regeneration have been reviewed critically and extensively by Young.[2] Since an understanding of the complex series of processes which accompany unaided regeneration of severed nerves is basic for any consideration of methods of closure of gaps too wide to be bridged by the unassisted normal process, a brief summary of some of the essential details, as now understood, may be helpful at this point.

1. Physical union between the separated stumps is accomplished, when the gap is not too great, by proliferating Schwann cells, most of which grow out from the distal stump, and by fibroblastic tissue. The parallel orientation of the elongated Schwann cells and fibroblasts in the union scar is of importance in controlling the direction of growth of fibers regenerating from the central stump, since these fibers may otherwise be lost in futile outgrowth into the collagenous tissue surrounding the nerve. If for any reason the fibroblastic tissue predominates in the union scar or interrupts the continuity of the bands of Schwann cells, such a connective tissue scar as it hardens may form a serious barrier to the regenerating nerve fibers.

2. Although the peripheral stump is capable of receiving new fibers for at least as long as seventeen months after injury, and the central stump retains the power to send out new fibers for much longer periods, the formation of a favorable union scar is prejudiced by delay in approximation of the stumps because of reduced outgrowth of Schwann cells from the cut surfaces, so that fibrous tissue predominates in the union scar.[3] This is one strong indication for primary or early repair as well as the probability that too long a delay in reinnervation of the end organs, especially in muscles, may permit irreversible regressive changes to occur in these end organs.[4]

3. The union scar must supply a full caliber bed of proliferating Schwann cells through which a majority of the regenerating fibers of the central stump, and their branches, may pass to the distal stump. This newly formed bed must allow as much cross sectional space as occurs in the distal stump to permit increase in caliber of the newly formed fibers and their myelination. The "maturation" of the regenerating fibers

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Supported by a grant from the National Foundation for Infantile Paralysis.

From the Poliomyelitis Laboratory, Department of Epidemiology, Johns Hopkins University.

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appears to be as important for return of functions as the successful attainment of proper end organs by these fibers.[5] It is likely that proper vascularization of the tissue bridging the gap between the stumps is also of importance.

The repair of traumatic gaps which cannot be closed in spite of mobilization of the nerve, rerouting, or articular movement is now attempted by means of stretching operations in two or three stages, nerve crossing, or nerve transplantation. Without discussing the advantages or disadvantages of these methods, it is proposed to describe a new method designed to make possible a simple primary or secondary repair of large nerves by means of a single stage operation.

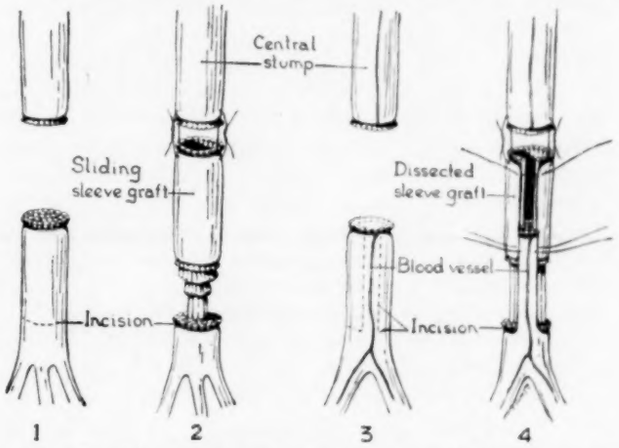
METHOD

The stumps of the injured nerve are freed from scar tissue, and the ends prepared as for end to end suture. After mobilization of the stumps as much as possible, a cylindric segment of the distal stump, embodying the nerve sheath and the underlying outer bundles of nerve fibers, and somewhat longer than the gap to be bridged, is prepared and moved proximally into apposition with the central stump. The sleevelike extension from the peripheral stump can be prepared in two ways, the choice being determined by circumstance. It can sometimes be freed distally by a circular incision in the peripheral stump which severs only the outer nerve sheath and peripheral bundles and then pulled proximally along the central core of the distal stump (figs. 1 and 2). However, when the inner sheaths of the nerve offer too much resistance to such a "sliding sleeve extension," the sleevelike extension can be dissected free from the inner core of nerve bundles, following the line of incision shown in figure 3, and moved proximally into apposition with the central stump as shown in figure 4. With this procedure it is possible to avoid severing the main blood vessel in the sheath of the peripheral stump.

With the sliding sleeve extension, sutures need be placed only at the line of apposition with the central stump, in the manner of end to end suture, the calibers of the sleeve extension and of the central stump being comparable. The absence of a distal suture line, such as occurs with ordinary grafts of nerves, is an advantage of obvious importance.

Sutures in the case of the dissected sleeve extension are placed as shown in figure 4. Fixation to the core of the distal stump can be obtained by suturing sheaths only, if the dissected sleeve has been made sufficiently long. In this case, as with the sliding sleeve extension, the central end of the core of the distal stump is protected from invading collagenous tissue by the enveloping sleeve of nerve tissue.

The advantages of the sleeve extension methods, which have been used successfully in experiments in rhesus monkeys, are: 1. Uncomfortable postures of limbs, as in nerve stretching operations, are avoided. Also avoided is the risk of overstretching the nerve with possible intraneural vascular interference or retrograde injury to fibers.[6] 2. No other nerve is deprived of function as in the case of nerve crossing or nerve autotransplant operations. 3. The repair procedure is confined to the site of the nerve injury. 4. Except for the junction with the normal central stump, which is soon crossed by regenerating fibers, there is no place where invading fibrous tissue can form a transverse barrier to outgrowing nerve fibers. In the case of transplant operations, for example, the distal union scar may require later resection to permit fibers which have regenerated to this point to pass into the distal stump.[7] 5. In autocable transplant operations, involving the preparation of segments of a normal cutaneous nerve in the form of a bundle which is sutured to the proximal and distal stumps of the injured nerve of the same patient, the outer fibrous sheath of each segment of transplanted nerve becomes incorporated in the substance of the repaired nerve, and this fibrous tissue may scarify to the extent of becoming rigid and preventing adequate enlargement and maturation of newly formed fibers within. In the case of the sleeve extension operations, excessive fibrous tissue is not incorporated into the interior of the repaired segment of nerve. 6. If repair by means of sleeve extension is done without too great delay after injury, the proliferative activity of the Schwann cells in the distal stump is utilized not only to accomplish union with the central stump but also to create a new and favorable bed for regenerating fibers within the cavity of the cylindric sleeve extension. The filling of this cavity with longitudinal columns of Schwann cells, along which regenerating fibers grow readily, compensates, as will be shown, for the initial deficiency of nerve substance within the sleeve extension. Moreover, the cavity of the sleeve extension is protected from invasion by fibrous tissue. Similarly, columns of Schwann cells migrate around the exposed core of the distal stump from the cut surfaces of nerve fascicles and increase the effective caliber of the nerve in this region.



1. Large peripheral nerve with traumatic gap irreducible by tension, rerouting or postural shortening. 2. Same with gap closed by means of sliding sleeve extension from distal stump. 3. Nerve with gap, showing line of incision for preparation of dissected sleeve extension. 4. Gap shown in 3 closed by means of dissected sleeve extension. Both types of operation are completed by contact approximation of sleeve graft with central stump and the placing of additional sutures through the sheaths at the plane of junction, as in end to end suture.

When a delay of several months has occurred preceding operation for repair, a sleeve extension can be prepared in similar fashion from the proximal stump, after resection of the neuroma, since the distal stump at this time may be of stiffer consistency and its Schwann cells may have reduced proliferative potencies.

The defects or difficulties of the sleeve extension operations, theoretical or real, are as follows: 1. The caliber of the distal stump is reduced by the preparation

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7. Davis, Loyal, and Cleveland, D. A.: Experimental Studies in Nerve Transplants, Ann. Surg. **99**: 271-283 (Feb.) 1934.

of the sleeve extension. As just pointed out, this is partly compensated for by Schwann cell proliferation, so as to allow for an adequate bed for most of the regenerating fibers. 2. The preparation of the sleeve extension may be complicated by branching of the distal stump in the course of the sleeve segment. If the branches are small they may be severed close to the main trunk and sutured to the nearest point of the exposed core of the distal stump after the gap in the parent trunk has been closed. If the branches are large it may be advisable to prepare the sleeve extension from the central stump. It is also possible to close the gap by using sleeve extensions from both the proximal and distal stumps. 3. The organization of the empty fiber sheaths of the distal stump is disrupted by the sleeve extension operations. It is obvious that this is no more serious than in transplant operations and is less serious than in nerve crossing. Whether functional recovery is seriously prejudiced thereby is unlikely, and in any case this point can be settled only by the results of practical experience.

EXPERIMENTS

Experiments with the method described on the large nerves of the extremities of rhesus monkeys are in progress and will be described in detail when completed. The primary criterion of adequate repair is considered to be the return of movements which cannot be replaced by the action of uninvolved synergistic muscles. At the time of writing several animals have shown good, and still continuing, recovery of lost digital movements three to four months after resection of 2 cm. of tibial or peroneal nerves, in the midfemoral region, followed by sleeve extension repair. Seven tibial nerves and two peroneal nerves are included in this series. Similarly, earliest recovery of finger movements, following median or radial nerve resection and repair in the midhumoral region, has occurred after five to six months in single cases. In the case of the radial and peroneal nerves the control nerves on the opposite side, in which a resected 2 cm. segment was sutured to the proximal and distal stumps in the original position, have shown recovery at about the same time. Observations are being continued.

Microscopic study of the tibial nerve of a control animal killed two months after sleeve extension repair of a 3 cm. defect with the sleeve prepared from the proximal stump has revealed that a great number of newly regenerated fibers had already traversed the zone of repair and had entered the distal stump, into which some fibers had penetrated for a distance of 17 mm., or a total distance of regeneration of about 47 mm. The sleeve extension was filled with loose schwannian tissue, well vascularized and conducting regenerating fibers. The exposed core of the central stump, from which the sleeve extension had been prepared, had increased in caliber, partly by condensation of connective tissue surrounding it. This connective tissue contained many parallel bundles of apparently vigorously regenerating fibers, which had already entered the neural tissue of the sleeve extension. The histologic picture of the region of repair, which grossly at autopsy appeared as a smooth, fusiform swelling of the tibial nerve not densely adherent to surrounding tissues, indicated that the region of repair had gained substance, effective as a bed for regenerating fibers, from both proliferated Schwann cells and from endoneurial and perineurial tissue. All these tissues can apparently adapt effectively in the maintenance of regenerating axons and in the eventual formation of a new nerve.

SUMMARY

A method described for the closure of irreducible traumatic gaps in nerves in a single operation, utilizing only the tissue of the injured nerve, may be of value in the repair, preferably early, of certain cases of injury to large nerves. The principle may also have application when used in combination with other methods of closing gaps, such as mobilization, rerouting or postural shortening and subsequent stretching. Early results of experiments in rhesus monkeys indicate that initial functional recovery with this method occurs at about the same time as recovery in nerves repaired with full thickness autografts. The degree of functional recovery finally attainable with this method remains to be determined.

1901 East Madison Street.

SUBDURAL HEMATOMA AND EFFUSION AS A RESULT OF BLAST INJURIES

FIRST PRELIMINARY REPORT

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Our purpose in this report is to bring forth a complication of war injuries which differs from trauma sustained in civilian life. This condition could be overlooked and the individual patient relegated to chronic invalidism or discharge from service with a diagnosis of a functional disorder, such as psychoneurosis or war neurosis.

Subdural hematoma is not an uncommon complication of craniocerebral trauma, usually the result of a direct blow to the skull, varying in degree of intensity. It has been shown that the hematoma occurs following the rupture of small veins, either between the layers of the dura or between the inner surface of the dura and the arachnoid.

Because of the poor absorptive action, due to a scanty blood supply to these membranes, the hematomas seldom disappear spontaneously. The blood contained in the subdural effusion or hematomatous mass undergoes chemical disintegration, giving rise to an entrapped liquid of higher protein content than is found elsewhere in the head. In an effort to correct this condition, cerebrospinal fluid is drawn from the subarachnoid space by osmosis, and the size of this fluid mass, gradually enlarged, produces a progression of symptoms. A liquid type of lesion has been referred to as subdural hydroma because, at operation, very little old blood is encountered; instead there is an escape of large amounts of xanthochromic fluid. The protein content of this fluid is higher than cerebrospinal fluid, which is indicative of stasis.

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We have observed a number of blast injuries sustained in action. They are the result of injury by a nearby exploding bomb on ship or land or may be the result of a concussion wave subsequent to a sinking ship or a depth bomb while the patient is in the water.

Examination of the fatal cases at autopsy reveals multiple hemorrhages throughout the body, varying from petechiae to frank bleeding.

It is our opinion that in some instances in which there is no direct blow a severe concussion from a bomb explosion at variable distance away[1] will lead to either a small subdural hemorrhage or a sudden rent in the arachnoid, permitting a temporary escape of the cerebrospinal fluid into the subdural space. It is felt that the arachnoid eventually effects a closure in the tear. The mass increases in size because of osmosis due to the increased protein content of the entrapped fluid, which may be mixed with small amounts of blood.

The patients present a history of exposure to severe concussion, loss of consciousness for a period varying from a few minutes to several days, persistent headaches, memory loss and irritability. It is seldom that many positive neurologic signs are present, and what few are evident are not pronounced. The most common findings are a slight facial palsy, a transient hemiparesis and occasionally a transient change in reflexes.

The most pronounced symptoms are persistent headaches, usually generalized (increased on exertion and often nocturnal), a history of coma, syncope or convulsions which did not exist prior to the blast, and a definite departure from a stable personality. Further studies from the psychiatric point of view are presented in the second preliminary report.[1]

The number of cases reported is small, but they are presented in the hope that there will be a more widespread recognition of this entity. There have been cases of bilateral effusion of small amounts of old blood and several ounces of xanthochromic fluid that we have chosen to call a subdural effusion in contrast to a true subdural hematoma, which is characterized by an

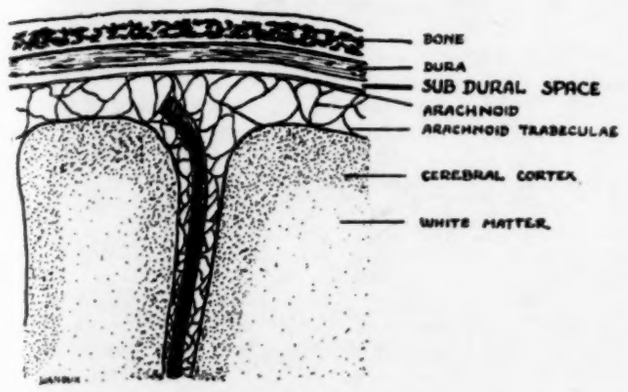

Diagram of subdural space.

accumulation of a large amount of blood. In only 1 case did both conditions occur: there was a large hematoma over the right cerebrum and 3 ounces of xanthochromic fluid on the left.

When such a lesion is suspected after a careful history has been obtained, thorough neurologic and psychiatric study will indicate the necessity for pneumoencephalography. If a hematoma or effusion is present in the subdural space, a characteristic filling defect is observed over the cerebrum with an occasional distortion of the ventricular system.

It is noted that in performing encephalography the total protein content of the cerebrospinal fluid is increased.

TABLE 1.—*Results of First Shipley-Hartford Retreat Test*

	Score	Mental Age
Vocabulary	32	17.8
Abstractions	28	15.7
Total	60	17.1

Conceptual quotient 88. Interpretation: In the direction of intellectual impairment.

TABLE 2.—*Results of Second Shipley-Hartford Retreat Test*

	Score	Mental Age
Vocabulary	30	17.0
Abstractions	40	20.5
Total	70	18.8

Conceptual quotient 120. Interpretation: Superior intelligence, no intellectual impairment.

REPORT OF CASE

R. T. G., private first class, aged 24, on active duty against enemy forces, on Sept. 27, 1942 was thrown to the ground by a nearby shell explosion. He was dazed, had difficulty in returning to his landing boat and remembered nothing for two days.

Following this period, severe generalized headache was present and became progressively worse with exertion. The cephalalgia was of such intensity that it would awaken him at night. He complained of vertigo and loss of memory.

General and neurologic examinations were negative. The blood pressure was 130/80 mm. of mercury, the pulse rate being 72. Roentgenograms of the skull were negative. On the Otis self-administering test of mental ability, higher examination, form B, he scored 59, intelligence quotient 117. The results of the Shipley-Hartford Retreat test of intellectual impairment are given in table 1.

Although these results were not conclusively abnormal, it was considered that there was a discrepancy between the Otis and Shipley tests and the clinical impression of the patient's original ability. It was concluded that there was a superior intelligence with evidence of intellectual dysfunction exclusive of the frontal lobes.

The persistent headaches and psychiatric findings led to a suspicion of a subdural lesion, and on November 27 pneumoencephalographic study was performed under tribromethanol in amylene hydrate anesthesia. The cerebrospinal fluid was under pressure of 200 mm. of water. One hundred and twenty cc. of this fluid was replaced with an equal amount of air.

The total protein of the fluid was 30 mg. per hundred cubic centimeters, the cell count was 4 and the Kahn reaction was negative. The colloidal gold curve was negative.

Roentgenograms indicated a filling defect over the left lower parietotemporal area and were significant of a space occupying lesion.

On December 7, under tribromethanol in amylene hydrate anesthesia, a perforator opening was made into the left superior temporal bone and a large subdural effusion was removed. The postoperative condition was uneventful and there has been a definite improvement in all his symptoms.

The Shipley-Hartford Retreat test was given on December 17 with the results presented in table 2.

1. Abbott, W. D.; Due, F. O., and Nosik, W. A.: Subdural Hematoma and Effusion as a Result of Blast Injuries: Diagnosis by Psychiatric Examination, J. A. M. A., to be published in the next issue.

OPERATIVE TECHNIC

Tribromethanol in amylene hydrate is administered rectally thirty minutes before surgical operation. A small incision is made over the indicated superior temporal area and a perforator opening is placed in the skull. The dura is tense and often bluish. When this is incised there is an escape of several ounces of either old blood or xanthochromic fluid. A small rubber catheter is placed over the temporal lobe and led out through the incision.

Closure is effected in layers with interrupted cotton sutures. If a bilateral defect is noted in the encephalogram, a similar procedure is carried out on the opposite side. One hour after the patient leaves the operating room a lumbar spinal drainage of 30 cc. of cerebrospinal fluid is performed with the dressing removed. Air is aspirated through the rubber catheter by negative pressure into the subdural space. The head dressing is replaced and the patient is taken to the x-ray room, where postoperative roentgenograms reveal the size of the preexisting lesion. This follows the technic described by Woods and Kahn [2] to prevent postoperative adhesions.

The drain is removed the next day, and the sutures within forty-eight hours.

The patient is up on the third day and returns to duty in six to eight weeks.

There have been no operative fatalities in the group operated on and most patients will be returned to duty. There have been 10 cases, 5 of which were bilateral. Seven patients had subdural effusions and in 2 instances subdural hematomas occurred.

SUMMARY

There is a group of patients suffering from the concussion effect of a nearby shell, bomb or underwater explosion who develop an accumulation of fluid in the subdural space. The chief complaints are headache, minor neurologic findings, and pronounced change in personality. Recognition and removal of either a subdural hematoma or an effusion will relieve these symptoms.

2. Woods, W. W., and Kahn, E. A.: Subdural Air, Surgery **12**: 471-481 (Sept.) 1942.

The Medical Adjective.—A good example of the overworked medical adjective is 'marked,' which is used to express so many qualities as to have become almost meaningless. It replaces great, copious, abundant, large, tangible, evident, perceptible, clear, unmistakable, decided, pronounced and others. In many cases its effect is purely emotional and has the same significance as the word 'bloody' in other fraternities. The word 'definite' has come to have a special meaning in our hands the reverse of its content in general use. When a doctor says 'there was enlargement of the spleen' we cannot misunderstand him; when he says 'there was definite enlargement of the spleen' he introduces an element of doubt, almost as if he was surprised at the finding and perhaps not quite sure of it. In any case he had added nothing to his description and, if he uses the phrase to three of his colleagues, one will believe that the spleen was considerably enlarged, another that the enlargement was slight, while the third, with perhaps greater insight, will assume the size of the organ to be within normal limits. The essence of professional description is to convey the same meaning to all who read or listen; if this be so then the word 'definite' and its objectionable partner 'very' might well be omitted from medical idiom.—The Decay of Medical Language, editorial, *New Zealand M. J.* **41**:235 (Dec.) 1942.

Clinical Notes, Suggestions and New Instruments

A METHOD FOR INTRODUCING SULFANILAMIDE INTO THE PERITONEAL CAVITY

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The value of sulfanilamide in the peritoneal cavity in intraperitoneal infection is well established. It is particularly important to place the crystals at the site of severest infection at which the highest concentration is desirable. The site of severest infection is usually the point of greatest contamination, which, in cases of perforated retrocecal or pelvic appendicitis, may be high in the right lumbar gutter or low in the pelvis. Unfortunately, it may be difficult or impossible to deposit the crystals at the desired point in patients operated on through a McBurney incision.

Fig. 1.—Showing cigaret drain with gauze packing pulled back and sulfanilamide crystals in the end of the drain. Sponge forceps holds crystals in place and assists in introducing drain into the desired location.

The introduction of the crystals high in the right lumbar gutter or low in the pelvis presents a mechanical problem which can be simply solved by the following procedure:

PROCEDURE

The gauze packing in a cigaret drain is pulled back from one end for a distance of 2 inches and sulfanilamide crystals are poured into this end of the drain. A sponge forceps is applied to the open end of the drain below the sulfanilamide, holding the crystals in place (fig. 1).[*] After the drain has been inserted into the desired location, the forceps is removed. The crystals leave the end of the drain and are dispersed in the adjacent tissue. By this one maneuver, sulfanilamide has been introduced to the point of greatest infection and a drain has also been placed to this site (fig. 2).

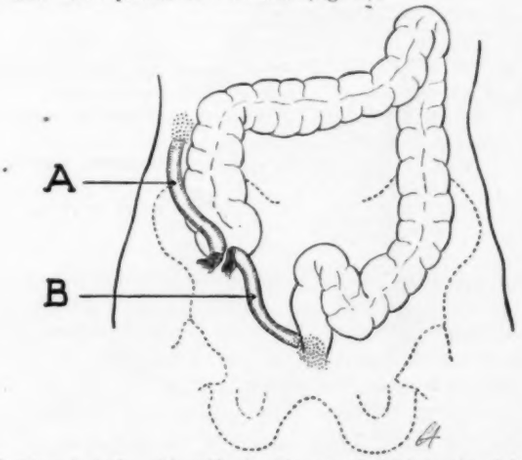

Fig. 2.—*A*, drain with sulfanilamide crystals high in the right lumbar gutter; *B*, drain with sulfanilamide crystals low in the pelvis.

Additional sulfanilamide is placed, in the usual manner, in that part of the peritoneal cavity directly exposed by the incision.

From the Surgical Service, Walter Reed General Hospital, Washington, D. C.

[*] Released for publication by the War Department Manuscript Board, which assumes no responsibility, other than censorship, for the contents of this article.

TWO ADDITIONAL CASES OF TRAUMATIC WINGED SCAPULA OCCURRING IN THE ARMED FORCES

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In a recent issue of THE JOURNAL Ilfeld and Holder [1] reported a case of traumatic paralysis of the serratus anterior muscle seen in their service at Camp Callan, California. The winged scapula in their patient resulted from trauma incidental to carrying a full knapsack. Two cases of paralysis of the serratus anterior muscle were seen at the Station Hospital, Langley Field, Virginia, in September. Because of the rarity of this condition and the unusual cause of these 2 cases, the findings seemed important enough to record in the medical literature.

CASE 1.—Private W. Q., aged 26, admitted to the Station Hospital Sept. 24, 1942, complained of a recurrent dislocation of his left shoulder on lifting heavy objects. He gave a history of having his left shoulder slip "out of place" when he lifted a garbage can on Sept. 16, 1942 while working with

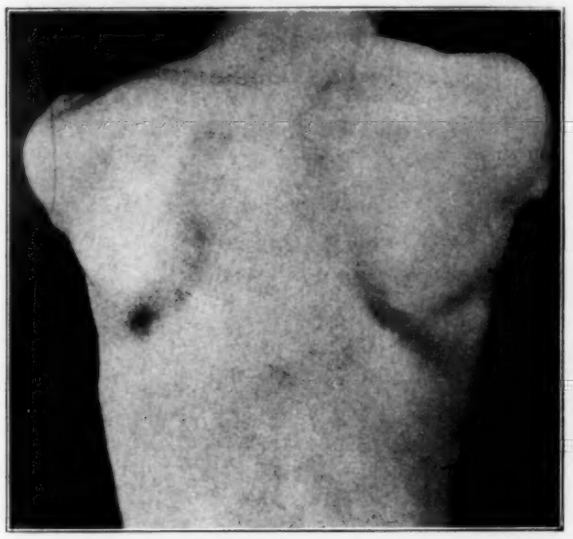

Fig. 1 (case 1).—Winging of left scapula.

a prison detail. Although right handed, he attempted to lift with his left hand. As he elevated the weight to shoulder height he experienced a burning sensation over the coracoid process radiating to the tip of the scapula. At the same time he felt his shoulder "slip out of place." He was relieved of heavy duty for one week, but when he attempted further lifting the shoulder repeatedly "slipped out of place." On September 25 severe pain developed in his left arm and neck and he was hospitalized. On admission he presented the classic picture of winging of the scapula on forward and lateral elevation of the left arm with no limitation of motion in or about the shoulder joint. Muscle and neurologic examinations were essentially negative except for an isolated paralysis of the serratus anterior muscle. The rest of the admission work-up was noncontributory. Treatment consisted of an application of heat to the shoulder with the arm supported in a sling. The patient was hospitalized for three months before sufficient power returned to his serratus anterior muscle to enable him to fix his scapula.

CASE 2.—Sgt. T. E. C., aged 20, was admitted to the hospital Sept. 3, 1942 after an automobile accident in which his car was overturned and crushed under a Pullman car. The patient was pinned for two hours in the front seat of his car in an inverted position with his left arm jammed against the door and most of his body weight resting on his left shoulder. When extricated from the wreck, he was hospitalized and found to be suffering from multiple bruises of both hips and the left flank, fractures of the transverse processes of the second and third lumbar vertebrae and complete musculospiral

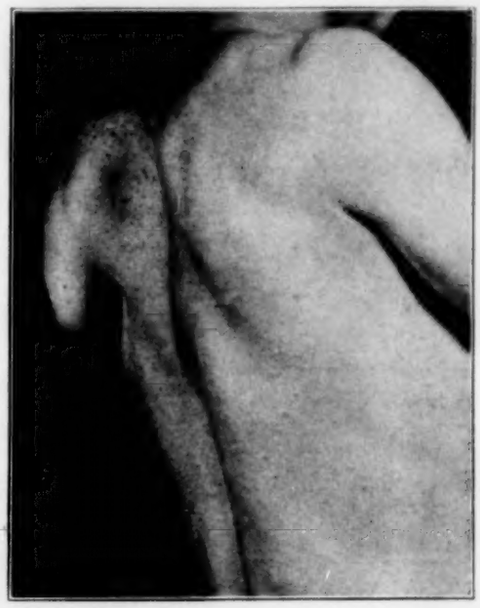

Fig. 2 (case 1).—Oblique view of winged scapula, showing lower division of trapezius to be unaffected.

Fig. 3 (case 2).—Winging of left scapula.

paralysis of the left extremity, in addition to winging of the left scapula. Examination of the shoulder revealed winging on forward and lateral elevation of the shoulder, with the left arm farther from the midplane than the right on complete elevation. It was possible to assist in complete elevation by thrusting forward and upward on the angle of the scapula.

Released for publication by the War Department Manuscript Board, which assumes no responsibility, other than censorship, for the contents of this article.

1. Ilfeld, F. W., and Holder, H. G.: Winged Scapula: Case Occurring in Soldier from Knapsack, J. A. M. A. **120**: 448 (Oct. 10) 1942.

There was complete paralysis of the serratus anterior muscle and lower division of the trapezius with an asymmetrical rounding of the posterior axillary fold as the chest was viewed from the front. Under conservative management the musculospiral palsy cleared up within a week's time, but the serratus paralysis continued, and it was felt necessary to place the muscle at complete rest by elevating the scapula and fixing it to the posterior wall of the chest. To secure this immobilization, a body cast was applied with a padded cradle for the left elbow. The cradle exerted a continuous upward thrust on the left shoulder, elevating and fixing the scapula and placing the serratus at rest in a relaxed position. With the application of the cast and the institution of heat and massage to the shoulder, the patient soon noticed greater strength and continued to regain muscle power. He remained in the hospital seventy-two days before his muscle power was strong enough to allow him to return to duty.

Fig. 4 (case 2).—Scapula immobilized in an elevated position by means of body spica with elbow cradle.

Fig. 5 (case 2).—Anterior view showing detail of body spica.

Many explanations have been offered to account for traumatic winging of the scapula. In all, a violent contusion or stretching of the nerve causes sufficient dissociation of continuity of the fibers to account for a paralysis which has, at best, a guarded prognosis. The nerve arises from the posterior roots of the fifth, sixth and seventh cervical nerves and courses through the scalenus medius muscle, uniting within or on the surface of the muscle, where it is relatively exposed for a short distance. In the first case, a contraction of the scalenus medius muscle in fixing the chest cage incidental to forceful lifting damaged the nerve. By contracting, the scalenus may have immobilized the nerve, causing it to be stretched as the shoulder completed its arc against resistance. In the second case the palsy resulted from prolonged pressure against the shoulder. The mechanism of pressure on the clavicle is not clear because the nerve is protected by the axillary nerve and brachial plexus as it courses behind the clavicle. Perhaps, in the second case as well, the scalenus, contracting to support the chest, pinched the nerve long enough to cause a palsy.

Fig. 6.—Detailed view of padded elbow cradle.

The exact mechanism of the disorder in the 2 cases of traumatic paralysis of the serratus anterior muscle here presented is not clear. That the mere lifting of a heavy object or the wearing of a full pack can give rise to prolonged or permanent disability should arouse the interest of all entrusted with the care of the armed forces. We make no claims for originality in presenting the detailed pictures of a simple and expedient immobilization cast. In addition to immobilization, heat and massage are the best means of promoting return of muscle power.

Special Article

HANDBOOK OF NUTRITION: XXIII

MEDICAL EVALUATION OF NUTRITIONAL STATUS

H. D. KRUSE, M.D.
NEW YORK

(Concluded from page 591)

These special articles on foods and nutrition have been prepared under the auspices of the Council on Foods and Nutrition. The opinions expressed are those of the authors and do not necessarily reflect the opinion of the Council. These articles will be published later as a Handbook of Nutrition.—ED.

STATES OF AVITAMINOSIS

From the concept of deficiency states it may be seen that an avitaminosis includes all forms, degrees and stages. Under this classification the classic deficiency disease, as originally described, represents the severe acute state. Such a term as latent or subclinical state, which has been objectionable to some investigators, is no longer necessary. It is seen to be a broad state comprising the mild acute and mild chronic conditions. It is preferable to use the more specific designation corresponding to the actual condition. The severe chronic state has had no previous designation.

The concept also explained the various courses in the pathogenesis of these states. Whereas the description thus far has indicated that any one of the several states exists alone, actually conditions are often more complex. Through the usual vicissitudes, particularly over years, the process usually changes in velocity, intensity and even direction. To mention one or two more common of the various eventualities, an acute subsides into a chronic process, or a mild or severe chronic state, once established, constitutes a base on which is superimposed a mild or severe acute process. Undoubtedly in the outbreaks of classic deficiency diseases the severe acute form is very frequently engrafted on a preexisting mild or severe chronic base. But these do not represent all the possible changes in rate, stage and intensity which a process may undergo. It may have a very variable and tortuous course. As a result, a mild or severe acute process in any stage may be seen with a mild or severe chronic form in any stage. These combined states add to the number of categories which must be borne in mind. Thus a deficiency disease may exist in any one of the following states: mild acute, severe acute, mild chronic, severe chronic, as well as mild or severe acute superimposed on mild or severe chronic, each in a particular stage. It cannot be overemphasized that the combined states are very prevalent, perhaps the most prevalent.

Scattered observations in the literature on deficiency diseases are in accord with one or another point in the concept. In addition to the reports already cited on the mild acute state, others have taken cognizance of the chronic state. In describing various forms of rickets, Eliot and Park[61] mentioned early mild, florid and mild chronic. Their description of the course of these respective states may be interpreted in terms of intensity and time.

Furthermore, the literature records the characteristic difference between the acute and chronic forms in response to treatment. Eliot and Park[62] remark that in one form of rickets the complete cure is slow. It has also been noted that in treatment of polyneuritis in animals, the acute fulminating type disappeared very speedily in a few days, the chronic type very slowly, in fact, only after many months.[63]

A few investigators have mentioned a chronic state of pellagra in contradistinction to the more dramatic acute form.[64] Some changes in the tongue in pellagra have been described erroneously as part of the acute process, whereas they were really chronic in nature.[65] In scurvy produced in animals, Tozer[66] differentiated the chronic from the acute form on a time basis. She stated that the chronic form varies in severity according to the degree of deprivation of vitamin C. Using a different terminology to express intensity, she described mild and severe degrees for both the acute and chronic forms. Recognizing these various states, Höjer[67] employed still another nomenclature. Ferrario[68] and Boyle[69] also produced acute and chronic scurvy in guinea pigs. Similar observations have been reported on experimental athiaminosis.[70]

The severe acute state is the form on which almost all clinical attention to deficiency diseases has hitherto been focused. Historically this form, presenting a grave problem, was the first to be recognized; consequently the recorded knowledge on its symptoms, signs and pathology predominate in the literature. Similarly in experimental work, where the objective was to demonstrate the existence of new vitamins or to assay foods, animals were suddenly shifted from an optimum natural to a deficient "purified" diet in which every trace of an essential had been as far as possible removed. Naturally the severe acute form of deficiency ensued. A few investigators have given attention to the mild acute state.

61. Eliot, Martha M., and Park, E. A.: Rickets, in Brennemann's Practice of Pediatrics, Hagerstown, W. F. Prior Company, Inc., 1938, vol. 1, chapter 36, pp. 62-65, 87, 92, 94.

62. Eliot, Martha M., and Park, E. A.: Rickets, in Brennemann's Practice of Pediatrics, Hagerstown, W. F. Prior Company, Inc., 1938, vol. 1, chapter 36, p. 65.

63. Vedder, E. B.: Beriberi, New York, William Wood & Co., 1913, chapter 10, pp. 208-209.

64. Titus, S. C.: Oratio de Pellagrae Morbi inter Insubriae Austriacae Agricolas Grassantis Pathologia Viteburg, 1792.[42] Strambio, Gaetano: Dissertazioni di Gaetano Strambio sulla Pellagra, Milan, Gio Batista Bianchi, 1794, diss. 2, pp. 103-105. Lalesque, F. A.: De la pellagre des Landes, Bull. Acad. Roy. de Med. **1**: 440-442, 1836. Morelli, Carlo: La Pellagra nei Suoi Rapporti Medici e Sociali, Florence, Murate, and Monaco, Giorgio Franz, 1856, chapter 2, p. 57.

65. Soler, Luigi: Osservazioni Medico-Pratiche Che Formano la Storia Esatta di una Particolar Malattia Chiamata Pellagra, in Cui Si Espongono I Veri Caratteri, le Differenze, le Cause ed il Metodo Giudicato il Piu Utile per Curarla, Venice, Andrea Foglierini, 1791, p. 10. Costallat, A.: Etiologie et prophylaxie de la pellagre, ed. 2, Paris, J.-B. Baillère et Fils, 1868, chapter 3, p. 148. Lombroso, Cesare: Trattato Profilattico e Clinico della Pellagra, Turin, Fratelli Bocca, 1892, part 3, chapter 1, pp. 214, 224. Lussana.[42]

66. Tozer, Frances Mary: On the Histological Diagnosis of Experimental Scurvy, Biochem. J. **12**: 445-447, 1918.

67. Höjer, J. Axel: Studies in Scurvy, Acta paediat. **3** (supp.): 7-278, 1924.

68. Ferrario, Carlos V.: La avitaminosis C experimental en el cobayo y las lesiones dentales y del paradencio, Rev. Odont. **29**: 206-224 (April) 1941; La avitaminosis C experimental en el cobayo y las lesiones dentales y del paradencio: II. Escorbuto Cronico, ibid. **29**: 273-284 (May) 333-349 (June) 1941.

69. Boyle, Paul E.: Experimental Scurvy in Guinea Pigs and Its Relation to Diffuse Alveolar Atrophy in Human Subjects, Harvard Dent. Rec. **11**: 5-9 (July) 1937. Boyle, P. E.; Bessey, O. A., and Wolbach, S. B.: Experimental Alveolar Bone Atrophy Produced by Ascorbic Acid Deficiency and Its Relation to Pyorrhea Alveolaris, Proc. Soc. Exper. Biol. & Med. **36**: 733-735, 1937. Boyle, Paul E.: Effect of Various Dietary Deficiencies on the Periodontal Tissues of the Guinea Pig and of Man, J. A. Dent. A. **28**: 1788-1793 (Nov.) 1941.

70. Prickett, C. O.; Salmon, W. D., and Schrader, G. A.: Histopathology of the Peripheral Nerves in Acute and Chronic Vitamin B_1 Deficiency in the Rat, Am. J. Path. **15**: 251-259 (March) 1939. Swank, R. L.: Avian Thiamine Deficiency: A Correlation of the Pathology and Clinical Behavior, J. Exper. Med. **71**: 683-702 (May) 1940. Swank, R. L., and Bessey, O. A.: Avian Thiamine Deficiency: 3. Characteristic Symptoms and Their Pathogenesis, J. Nutrition **22**: 77-89 (July 10) 1941.

In the past the chronic state of deficiency diseases has received only sporadic and scant notice. Paradoxically, however, chronic manifestations have been frequently seen but their relation to nutrition was not recognized. The mild chronic state has been undetected or neglected. Generally the mild acute, mild and severe chronic states, the most common states among the population, have not been recognized and differentiated. The very prevalent combination acute with chronic has not been fully appreciated as such, and the constituent forms have not been distinguished and separated.

Since the chronic state of deficiency diseases has not been commonly recognized, it is worth while to mention some of its characteristics. Its essence is time. For persons this is age. The longer persons live, the more chance they have to incur changes and to have them develop to an advanced state. Consequently chronic changes are seen with greater frequency and in the latest stages with increasing age. I have noted this in avitaminosis A, ariboflavinosis, aniacinosis and avitaminosis C.

In the past these chronic alterations have been called senile changes with the implication that senility causes them. But senility per se is not responsible for them. That has never been a satisfactory explanation. Not all elderly persons show the changes. On the other hand, they occur in children.[71] Time, not senility, is the essential point. And time does not start the changes, it simply is a dimension over which they progress. They are specific avitaminoses in a state of chronicity, due usually to dietary deficiencies running over a period of years. Their prevalence and severity vary with the number and degree of deficient diets and therefore with the economic level. Most important of all they are reversible, yielding slowly but completely to appropriate therapy.

This rate of response is another characteristic peculiar to the chronic process. Whereas acute changes respond with considerable promptness, chronic changes recede very slowly. In acute changes we are accustomed to expect improvement with dramatic rapidity. Actually, some of rapidity is more apparent than real. For one thing it is a relative matter; the more pronounced the acute, the more spectacular is a given degree of improvement. Often removal of late signs constitutes supposed rapid cure of an acute deficiency. Obviously this is far from complete cure. But it is mainly because the relief of symptoms, the first event, is so prompt as to be striking. If judged solely by freedom from symptoms, the therapeutic response of an acute process is rapid. But when judged by complete restoration of all tissue changes, as seen by the biomicroscope, response in the acute condition is not quite so spectacularly quick as it is reputed. Nevertheless, response is infinitely more rapid in the acute than in the chronic state.

METHODS OF APPRAISAL

With this concept of the various states in mind, it is appropriate to consider the various new methods that have been proposed for use in appraising nutritional status. They comprise biochemical, microbiologic, biophysical (most of which are functional), special clinical and morphologic, including biomicroscopic. At once it should be stated that they pertain to different aspects of deficiency diseases and yield dissimilar kinds of information.

Most of the biochemical methods are designed to determine the concentration of the vitamins in the blood and urine. One kind of method is based on the reaction of a vitamin to yield a colored or fluorescent substance which, under suitable conditions of intensity and stability, may be estimated. Another kind depends on the reaction of a vitamin with a dye which is carried partially or entirely to completion so that the residual color or end point, respectively, may be determined. For each reaction there are usually several methods, differing only in the size and preparation of the sample and means of estimating the concentration of the vitamin. These reactions are rendered quantitative by colorimetry, fluorimetry and titrimetry, and objective by spectrophotometry or photoelectrometry.

Microbiologic methods depend on the failure of a particular micro-organism to grow in the absence of a specific vitamin. The concentration of the essential is assayed by the degree to which it stimulates growth. Or it is measured by its accelerating action on a biologic process such as fermentation.

For information bearing on the state of nutrition with respect to an essential, the biochemical and microbiologic methods may be applied in four ways. The concentration of the vitamin in blood is determined on specimens collected before breakfast. For a vitamin that is excreted in the urine, the amount there may be ascertained from one or more specimens collected after an interval of several hours from the last meal or from a twenty-four hour sample. In general, low values for the vitamin in either instance point to a recent diet deficient in the essential. Other procedures comprise measuring the response to a test dose of the vitamin, by determining either its absorption from the blood or its excretion in the urine. Here for both blood and urine the methods differ in the amount of vitamin administered, the number of samples to be taken and the time of drawing them. Usually the blood technic includes initial or pretest, peak and subsequent basal determinations. Most of the excretory methods restricted to the collection of one or a few specimens are designed to cover the period of maximum response; some call for a twenty-four hour sample. These urinary response procedures are the saturation, tolerance or load tests. Low values by the procedures involving response to a test dose indicate not only that the previous dietary intake has been deficient but also that the reservoirs are depleted. These several procedures yield information of different character because they bear on such different aspects as transport, storage, utilization and excretion of the vitamin.

Two of the vitamins also occur in the blood as constituents of coenzymes. Hence concentration of that is also determined by the foregoing types of methods. Also chemical methods are used to determine the accumulation of metabolites in the blood or to detect the presence of an abnormal pigment in the urine as the result of a vitamin deficiency.

Among the biochemical methods on blood, the formation of a blue color when vitamin A is treated with a chloroform solution of antimony trichloride[72] provides

71. Since it was obviously inappropriate to apply the term senile changes to children, the equally unsuitable name presenile changes was used.

72. Carr, F. H., and Price, E. A.: Colour Reactions Attributed to Vitamin A, Biochem. J. **20**: 497-501, 1926.

the means for determining vitamin A concentration.[73] Oxidation of thiamine to thiochrome and measurement of the intensity of the latter's fluorescence[74] forms the basis of estimating the thiamine level.[75] Another method for detecting avitaminosis B_1 depends on the increase in values for bisulfite binding substances[76] or pyruvic acid[77] signifying failure in decarboxylation from deficiency in thiamine.

The level of cocarboxylase (thiamine diphosphate ester or thiamine pyrophosphate, which functions as a coenzyme or carboxylase in conversion of pyruvic acid into carbon dioxide and acetaldehyde) may be determined in three ways: differential solubility of thiochrome and thiochrome pyrophosphate,[78] enzymatic conversion of cocarboxylase into thiamine[79] or manometric determination of the carbon dioxide released during an enzymatic process in which pyruvate is the substrate.[80] Goodhart and Sinclair[81] have pointed out that estimation of thiamine or cocarboxylase in whole blood is not a reliable means of detecting possible deficiency of thiamine. They regard lowered concentration of thiamine in the plasma as furnishing more trustworthy evidence.

For determination of nicotinic acid or nicotinamide in the blood, the reaction of these substances with an aromatic amine and cyanogen bromide[82] provides several methods.[83]

A number of chemical methods have been devised for assaying ascorbic acid in the blood,[84] most of them based on the reduction of 2:6 dichlorophenolindophenol,[85] a few of methylene blue.[86] The application of these methods in various procedures has already been reviewed.[87]

Methods for determining calcium,[88] phosphorus and phosphatase[89] levels are well known. Disturbances in these components are associated with rickets.

Plasma or serum proteins may be determined by a convenient colorimetric method.[90] The significance of alterations in these blood constituents, particularly albumin, has been described at length.[91]

Nutritional anemia due to iron deficiency is microcytic and hypochromic in type. Although microcytosis may occur alone, diminution in hemoglobin concentration of the blood is usually an early sign. In the comprehensive examination in private practice or the hospital, a complete hematologic examination is desirable. But in surveys on a large scale the objectives and possible results must be weighed against the limitations in time and personnel and the magnitude of the work. It is doubtful that it would be justifiable to conduct a thousand blood counts when only a few will yield low values. Rather, determination of hemoglobin concentration would seem to be sufficient for most surveys.

73. Lanzing, J. C.: De bepaling van het vitamine A-en het carotinoidengehalte in 1 ccm.ä 2 ccm. bloed, Geneesk. tijdschr. Nederland.-Indië **78:** 3135-3144, 1938. Kimble, M. S.: The Photocolorimetric Determination of Vitamin A and Carotene in Human Plasma, J. Lab. & Clin. Med. **24:** 1055-1065, 1939. May, C. D.; Blackfan, K. D.; McCreary, J. F., and Allen, F. H., Jr.: Clinical Studies of Vitamin A in Infants and in Children, Am. J. Dis. Child. **59:** 1167-1184 (June) 1940.

74. Jansen, B. C. P.: A Chemical Determination of Aneurin by the Thiochrome Reaction, Rec. d. trav. chim. d. Pays-Bas **55:** 1046-1052 (Nov. 15) 1936; Quantitative Bestimmung von Aneurin, Ztschr. f. Vitaminforsch. **7:** 239-244, 1938.

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The results from surveys demonstrate the usefulness and adequacy of this single procedure.[92]

Here is a technic known for a long time but too often neglected, or conducted by instruments capable of revealing only wide abnormalities and yielding such errors that they could not reveal slight deviations or reported in terms of variable standards,[93] with variable allowance for normal range. Osgood [94] has admonished that "all hemoglobin estimations should be reported in grams per hundred cubic centimeters and the method used should be stated. Otherwise the great variation (13.8 to 17.3) in the number of grams of hemoglobin taken as 100 per cent in different methods and the enormous differences in the accuracy of the methods will make correct interpretation of the results impossible."

Furthermore, in view of indications from other deficiency diseases, perhaps more consideration should be given to slight or marginal changes in hemoglobin concentration. Some agreement on standards, recognition that one level as a standard will not suffice for all ages [95] and perhaps narrowing of the present wide range accepted as normal are items in need of consideration. Moreover, to remove errors inherent in most instruments, the method should be performed whenever possible on a photoelectric colorimeter.

For assaying the vitamins in urine, the biochemical methods are based mostly on the same reactions as in blood. In the estimation of thiamine the thiochrome [96] or diazotized P-aminoaceto-phenone reactions is utilized.[97] Riboflavin excreted as uroflavin is measured by a fluorometric method.[98] Nicotinic acid derivatives may be determined by their reaction with cyanogen bromide in the presence of a suitable amine.[99] Another method for detecting aniacinosis depends on the appearance of a fluorescent substance.[100] Several methods for determination of vitamin C, based on the reduction of 2:6 dichlorophenolindophenol [101] or methylene blue,[102] vary in technical points and procedures for appraising the state of vitamin C nutrition. A very complete literature on this has been reviewed.[87]

Of the microbiologic methods on blood, the estimation of thiamine concentration [103] was based on the necessity of this substance for growth of the fungus Phycomyces blakesleanus.[104] That thiamine was found to increase the rate of fermentation [105] was utilized in another type of method.[106] The indispensability of riboflavin for lactic acid bacteria [107] led to a method for determining the concentration of this vitamin in blood by use of Lactobacillus casei.[108] Factor V, a growth factor for

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Hemophilus parainfluenzae, has been shown to be replaceable by two coenzymes (cozymase or codehydrogenase) which contain nicotinamide. Hence this microorganism has been used to measure the cozymase content of the blood.[109] But it is stated that determination of coenzyme I offers little diagnostic information in borderline cases of deficiency disease.[110] The fermentation test has been used in determining the thiamine content of urine.[111] Riboflavin in the urine has been estimated by bacterial assay with L. casei.[112] With dog's urine the growth of Bacterium paradysenteriae and H. parainfluenzae has been used to assav the content of nicotinic acid [113] and factor V respectively.[114]

In an attempt to simplify the method of estimating tissue saturation with vitamin C, Rotter [115] introduced the intradermal test whereby a small amount of dichlorophenol-indophenol dye is injected beneath the skin and the fading time is recorded. The validity and reliability of the test have been questioned, principally because its values do not correspond with plasma levels of vitamin C.[116] Recently this skin test was found to be more closely related to the urinary excretion test for saturation with vitamin C.[117]

Biophysical methods have been designed to elicit under stress and to measure by special instruments functional or structural impairments attributed to avitaminoses. Methods for detection of visual dysadaptation to darkness were in use long before they were proposed as a means of recognizing early avitaminosis A.[118] Following Fridericia and Holm's experimental production of night blindness in rats on an A-deficient diet,[119] Jeans suggested that dysadaptation be used as an index of avitaminosis A.[120] Several instruments for measuring dark adaptation have been devised.[121] These instruments have been shown to have technical faults and the test itself has been criticized on its subjectivity, lack of fixed threshold and standards.[122] The extensive literature on the subject has been presented.[123] Furthermore, under actual field conditions in three surveys the most recent models gave disappointing results, since a single measurement of the visual threshold was found not to be a reliable indicator of mild avitaminosis A.[124] The fault seems to lie not in the instruments or in their ability to detect dysadaptation but in the inference that dysadaptation appears as a sign of early or mild avitaminosis A. The latter inference has been questioned.[55]

Measurement of capillary resistance to pressure, another biophysical method, has been applied in appraising vitamin C status. Like dysadaptation, capillary fragility was originally described in association with a variety of pathologic states.[125] In 1914 Hess described tests with positive pressure showing impaired capillary resistance in scorbutic infants.[126] Using the same procedure and counting petechiae, Göthlin suggested that capillary resistance or fragility be used as a measure of vitamin C status.[127] Meanwhile, a method for measuring capillary fragility by application of negative pressure had been developed and used in many diseases,

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121. Jeans, P. C.; Blanchard, E. L., and Satterthwaite, F. E.: Dark Adaptation and Vitamin A: Further Studies with the Biophotometer, J. Pediat. **18:** 170-194 (Feb.) 1941. Hecht, Selig, and Shlaer, S.: Adaptometer for Measuring Human Dark Adaptation, J. Optic. Soc. America **28:** 269-275 (July) 1938. Feldman, J. B.: Practice of Dark Adaptation (review), Arch. Ophth. **19:** 882-901 (June) 1938. The Use of the Photometer in Detecting Latent Avitaminosis A, Nutrition: The Newer Diagnostic Methods, Proceedings of the Round Table on Nutrition and Public Health, Sixteenth Annual Conference of the Milbank Memorial Fund (March 29-31) 1938, pp. 63-75. Sloan, Louise L.: Instruments and Technics for the Clinical Testing of Light Sense: I. Review of the Recent Literature, Arch. Ophth. **21:** 913-934 (June) 1939; II. Control of Fixation in the Dark Adapted Eye, ibid. **22:** 228-232 (Aug.) 1939; III. An Apparatus for Studying Regional Differences in Light Sense, ibid. **22:** 233-251 (Aug.) 1939. Pett, L. B.: Vitamin A Deficiency: Its Prevalence and Importance as Shown by a New Test, J. Lab. & Clin. Med. **25:** 149-160 (Nov.) 1939. Pett, L. B., and Lipkind, M. K.: Factors Affecting the Pett Visual Test for Vitamin A Deficiency, Canad. J. Res. (B) **19:** 99-108 (April) 1941. Wald, George: A Portable Visual Adaptometer, J. Optic. Soc. America **31:** 235-238 (March) 1941. Jeans and Zentmire.[51] Hecht.[51]

122. Snelling, C. E.: A Study of the Birch-Hirschfeld Photometric Test for Vitamin A Deficiency, J. Pediat. **9:** 655-661 (Nov.) 1936. Palmer, C. E., and Blumberg, Harold: The Use of a Dark Adaptation Technic (Biophotometer) in the Measurement of Vitamin A Deficiency in Children, Pub. Health Rep. **52:** 1403-1418 (Oct. 8) 1937. Palmer, C. E.: The Dark Adaptation Test for Vitamin A Deficiency, Am. J. Pub. Health **28:** 309-315 (March) 1938. Hunt, Eleanor P., and Palmer, C. E.: Medical Evaluation of Nutritional Status: II. Measurement of Visual Dark Adaptation with the Adaptometer, Milbank Memorial Fund Quart. **18:** 403-424 (Oct.) 1940.

123. Hunt and Hayden.[53]

124. Steven, David, and Wald, George: Vitamin A Deficiency: A Field Study in Newfoundkand and Labrador, J. Nutrition **21:** 461-476 (May) 1941. Yarbrough, M. E., and Dann, W. J.: Dark Adaptometer and Blood Vitamin A Measurements in a North Carolina Nutrition Survey, J. Nutrition **22:** 597-607 (July) 1941. Hunt and Hayden.[53]

125. Koch, C.: Ein Beitrag zur Purpura bei Kindern, Jahrb. f. Kinderh. u. physisch. Erzieh. **30:** 403-408, 1889-1890. Rumple, T.: Aerztlicher Verein im Hamburg, Sitzung vom 15 Juni 1909, München. med. Wchnschr. **56:** 1404, 1909. Leede, C.: Hautblutungen durch Stauung hervorgerufen als diagnostisches Hilfmittel beim Scharlach, ibid. **58:** 293-295 (Feb.) 1911; Zur Beurteilung des Rumple-Leedeschen Scharlachphänomens, ibid. **58:** 1673-1674 (Aug.) 1911. Lewis, Thomas, and Harmer, I. M.: Rupture of Minute Vessels in Skin and Distributions of Cutaneous Haemorrhages and Other Skin Eruptions, Heart **13:** 337-355 (Dec.) 1926.

126. Hess, A. F.: Survey—Past and Present, Philadelphia, J. B. Lippincott Company, 1920, chapter 7, p. 212. Hess and Fish.[59]

127. Göthlin, G. F.: Outline of a Method for the Determination of the Strength of the Skin Capillaries and the Indirect Estimation of the Individual Vitamin C Standard, J. Lab. & Clin. Med. **18:** 484-490 (Feb.) 1933; A Method of Establishing the Vitamin C Standard and Requirement of Physically Healthy Individuals.[52]

but not with reference to vitamin C undernutrition.[128] Later it was adapted to appraising vitamin C status.[129]

Several investigators have found no correlation between the values for capillary resistance and the plasma concentration or urinary excretion of ascorbic acid.[130] More important, the method yielded a high degree of variation in values. Its limitations have been fully discussed.[131] It is useful for recognizing somewhat severe acute scurvy. But it does not detect early or mild avitaminosis C, for capillary fragility does not appear in this state.[58]

For many years, tests of neuromuscular response to galvanic stimulation were employed in clinical medicine. Although the method was first applied to adults,[132] its use was soon limited to the diagnosis of "latent" tetany in infants and children.[133] It indicated, therefore, disturbances in calcium or vitamin D, or both. Its wide variability in older children and adolescents and the availability of methods for determining the content of calcium in the blood led to almost complete abandonment of the neuromuscular method.

Morphologic methods include the x-rays, the microscope and the biomicroscope with simple inspection for definite lesions. New aids in the recognition of slight changes in the skeleton in early scurvy by x-ray examination have been furnished.[54] At the same time it has been pointed out that subperiosteal hemorrhages in infantile scurvy may not be visualized on the roentgenogram until administration of vitamin C induces deposition of calcium salts in the periosteum.[134]

According to Eliot and Park[135] "the x-rays give more accurate information concerning the existence of active or healing rickets than physical examination, but for early diagnosis they have limitations. . . ." Furthermore, it has been shown that there may be conflict of opinion as to the presence or absence of evidence of rickets in individual films.[136]

By differential staining and microscopic examination the demonstration of keratinized epithelial cells in the scrapings from the cornea, the nose and the mouth, and in secretions from the trachea, bronchi, kidneys and vagina has been proposed as confirmatory diagnostic evidence in suspected cases of avitaminosis A.[137] It will be noted this procedure was not asserted to be a means of early detection.

Gross and biomicroscopic examination of the conjunctiva, ocular limbus, tongue and gums reveals all forms, degrees and stages of avitaminosis A, ariboflavinosis, aniacinosis and avitaminosis C respectively.[138] In each specific tissue site selected for observation the pathologic process not only appears early but persists and changes in correspondence with the course of the avitaminosis. Furthermore, the site is readily accessible to observation. Although very much may usually be seen grossly in moderate and severe states, the biomicroscope is exceedingly sensitive in revealing the very early and slight tissue changes. It allows low grade states, whether prolonged or not, to be detected. In fact, it is essential for observation of these states. The slighter the change and the closer it approaches perfection, the more the microscope is needed. From this examination, status is expressed for both acute and chronic processes, each in terms of stage and degree.

CHOICE OF METHODS

Which kind of method is best? The answer depends on the purpose for which the method is to be used. The outstanding objective is the appraisal of nutritional status in the population, to be conducted in schools, industry, business organizations, private practice, hospitals, public health centers and fields surveys. Certain requirements inherent in this objective must be met. The test for a particular deficiency disease should be simple, easy, quick and reliable. Preferably it should be objective rather than subjective. Practical considerations require that it be feasible. The tests for individual deficiencies should be adaptable to combination in a system of examination which retains all the qualities enumerated. Furthermore, such a system should not require too many instruments or large personnel. When one instrument can be used for several tests there is a distinct advantage. The system must also be applicable to all ages, adults as well as children. No age group should be overlooked. It should be noted that many methods in the past applied exclusively to children. Malnutrition in adults has been a neglected subject. Important as is nutrition in the growth period, it is equally important in the later decades. Recognition of the chronic state gives emphasis to this statement. Finally, in order to characterize malnutrition it is essential not only to detect the occurrence but also to establish the status of each deficiency disease. It is particularly important that the system of evaluation should be effective in detecting the states in which deficiency diseases actually exist most frequently in the population. Most of the deficiency states in this country are chronic, in all degrees and with or without an accompanying mild or severe acute process.[139] Hence the system should permit detection of all forms, stages and degrees.

The several kinds of tests vary in meeting these requirements. Biochemical and microbiologic methods on blood, despite their usefulness and essentiality for many purposes, have disadvantages for application in surveys. They are laborious, are time consuming and require a laboratory with trained personnel. Unfortu-

128. Hecht, A. F.: Experimentell-klinische Untersuchungen über Hautblutungen im Kindesalter, Jahrb. f. Kinderh. **65:** 113-131, 1907. Frontali, Gino: I Capillari nel Bambino: Studi sull'Aspeto Microscopio sulla Resistenza, sulla Permeabilità e sulla Pressione Capillare nel Vivente, Arch. di pat. e clin. med. **6:** 1-90 (March) 1927. da Silva-Mello, A.: Die Wandresistenz der Blutkapillaren (Eine einfache, klinische Methode zu ihrer genauen Messung), München. med. Wchnschr. **76:** 1717-1718 (Oct. 11) 1929. Cutter, I. S., and Marquardt, G. H.: Studies in Capillary Fragility, Proc. Soc. Exper. Biol. & Med. **28:** 113-115 (Nov.) 1930. Cutter, I. S., and Johnson, C. A.: Studies on Capillary Fragility; A Device for Study of Capillary Hemorrhage, J. A. M. A. **105:** 505-506 (Aug. 17) 1935.

129. Dalldorf, Gilbert: A Sensitive Test for Subclinical Scurvy in Man, Am. J. Dis. Child. **46:** 794-802 (Oct.) 1933. Schultz, M. P.: Studies of Ascorbic Acid and Rheumatic Fever: II. Test of Prophylactic and Therapeutic Action of Ascorbic Acid, J. Clin. Investigation **15:** 385-391 (July) 1936.

130. Abt, A. F.; Farmer, C. J., and Epstein, I. M.: Normal Cevitamic (Ascorbic) Acid Determinations in Blood Plasma and Their Relationship to Capillary Resistance, J. Pediat. **8:** 1-19 (Jan.) 1936. Anderson, G. K.; Hawley, Estelle E., and Stephens, D. J.: Capillary Fragility and Vitamin C, Proc. Soc. Exper. Biol. & Med. **34:** 778-782, 1936. Liebmann, James; Wortis, Herman, and Wortis, Ethel: Note on the Lack of Correlation of Capillary Fragility with Vitamin C Content of Blood, Spinal Fluid and Urine, Am. J. M. Sc. **196:** 388-392 (Sept.) 1938.

131. Göthlin, G. F.: When Is Capillary Fragility a Sign of Vitamin C Subnutrition in Man? Lancet **2:** 703-705 (Sept. 18) 1937. Sloan, R. A.: A Comparison of Methods for Detecting and Grading Subclinical Scurvy, J. Lab. & Clin. Med. **23:** 1015-1026 (July) 1938.

132. Erb, W.: Zur Lehre von der Tetanie nebst Bemerkungen über die Prüfung der electrischen Erregbarkeit motorischen Nerven, Arch. f. Psychiat. u. Nervenkrankh., **4:** 271-316, 1874.

133. Holmes, J. B.: The Reliability of the Electrical Diagnosis of Tetany with Especial Consideration of the Electrical Value Found in Normal Children, Am. J. Dis. Child. **12:** 1-29 (July) 1916.

134. Nelson, W. E.; Doughty, W. M., and Mitchell, A. G.: Roentgenographic Visualization of Subperiosteal Hemorrhage in Infantile Scurvy, J. A. M. A. **101:** 14-17 (July 1) 1933.

135. Eliot, Martha M., and Park, E. A.: Rickets, in Brennemann's Practice of Pediatrics, Hagerstown, Md., W. F. Prior Company, Inc., 1938, vol. 1, chapter 36, p. 92.

136. Cooley, T. B., and Reynolds, L.: The Interpretation of X-Ray Films in the Diagnosis of Rickets, J. Pediat. **10:** 743-747 (June) 1937.

137. Blackfan, K. D., and Wolbach, S. B.: Vitamin A Deficiency in Infants: A Clinical and Pathological Study, J. Pediat. **3:** 679-706 (Nov.) 1933.

138. Kruse, footnotes 55, 57 and 58. Kruse, Sydenstricker, Sebrell and Cleckley.[56] Sydenstricker, Sebrell, Cleckley and Kruse.[58]

139. Kruse, H. D.: Unpublished observations.

nately too, as a means of appraising nutrition they have very narrow limitations beyond which they are misleading.

In the evolution and recession of an avitaminosis, the change in concentration of a vitamin in the blood and the alteration in tissue state are not synchronous. They are on different time schedules. Blood is the labile transport system. If in the initial attack the tissue were normal and the blood value were low, such a value would be significant. But practically this condition is the least frequent in the general population, indeed relatively unprevalent, and would be found mostly in infants and preschool children. With widespread prevalence of avitaminoses, particularly in the chronic form, and their establishment early in life in most persons, a perfect state in the tissue is relatively infrequent. It should not be forgotten, furthermore, that the biomicroscopic examination of tissue is sensitive in detecting the very early and mild tissue changes, indeed all states. Hence the blood method as a primary screen for the appraisal of vitamin C status has in reality a very limited range of application.

Once chronic changes have appeared—and this is the common eventuality and the most prevalent state—the blood values may be unreliable. The chronic process in the tissue recedes exceedingly slowly, almost infinitesimally, on any sustained improvement in diet and only very slowly under persistent therapy. In contrast, values on the concentration of a vitamin in the blood reflect very sensitively the recent dietary habits [140] as well as other conditioning factors. They may change not only with season [141] but also within shorter periods; they may fluctuate. Blood values rise rapidly in reflecting changes in improved intake, such as from seasonal or occasional dietary improvement, but with no noticeable effect in the chronic process in the tissue. A sustained satisfactory blood level resulting from adoption of a satisfactory diet or taking of low potency maintenance tablets, now so popular, is not accompanied by any appreciable improvement in an existing severe chronic pathologic condition in the tissue. Potent therapy will produce maximum blood levels and entirely restore bodily saturation in several weeks but will completely repair the slightest chronic tissue lesion only in months. Here a high blood level will be maintained over the many months while the tissue lesion is receding but is, of course, still abnormal. Temporarily or consistently, therefore, the blood values may, under these several circumstances, be moderate or high without demonstrable recession in the existing chronic lesion. In any of these instances the blood value would indicate a satisfactory nutritional status while the tissue would be pathologic. Manifestly, appraisal from the blood value alone would be entirely misleading.

It should be clear that there is no necessary high correlation between data derived by different methods on the same deficiency disease. They provide information on different aspects and states of the disorder. Unfortunately, this fact has not been appreciated. Rather, it has been thought that various methods applied to the same deficiency disease should yield similar data. On this basis it has become the practice to test the validity of a method by comparing its results with blood values. This procedure is entirely unsound. When it is remembered that blood values shift rapidly and may fluctuate intermittently, while tissue changes very slowly, there should be no expectation of identical results.

An example demonstrating these points is particularly revealing. With the development of accurate methods for determining the concentration of ascorbic acid in blood and urine, analyses have been conducted on these fluids, after a fasting period or a test dose, as a means of appraising vitamin C status. There has been a strong trend toward general acceptance of the results from these procedures as the true index of bodily status with respect to vitamin C. Indeed, the reliability of other methods of appraisal has been gaged by comparison with blood values as the criterion. Yet Greenberg, Rinehart and Phatak [142] cautioned ". . . the estimation of the reduced plasma ascorbic acid is only a measure of the immediate nutritive or metabolic level relative to vitamin C and is dependent on recent dietary habits to a large degree. Although it is an index of the vitamin C nutrition at the time of the test, in a single case a low level does not imply tissue injury or scurvy (either clinical or subclinical). The latter results from the operation of suboptimal or low metabolic levels over some period of time. Conversely, a good or high level would not indicate that deficiency had not operated to produce tissue injury in the past."

In line with this statement, Crane and Woods,[19] studying an acute outbreak of scurvy in children by comparing gingival condition with ascorbic acid concentration in plasma both in the autumn and in the following spring, found that 7 of 17 children with consistently high ascorbic acid values on both occasions had gingival inflammation at one or the other examination, while 14 of 25 children with inflammation of at least six months' duration had high values on one or the other occasion. A similar comparison of ascorbic acid values with the states of the gingival lesions which I [58] conducted in a low income group, with a more sensitive method of detecting and more rigid criteria of rating pathologic conditions in the gums, revealed an even less constant relationship. These results, far from demonstrating that the blood level is a trustworthy criterion for comparison of other methods, show that it has serious restrictions as a method for appraising vitamin C status. Determination of the excretory level and bodily saturation tests, whether from serial analyses on blood or on urine, also have these limitations.

In several hands, routine examination by the biophysical methods has failed completely to detect early or even moderately intense avitaminosis.[143] Either the disturbances, e. g. dysadaptation and petechiae, are not pronounced enough in their early stages to be detected or they are late manifestations.

The limitations of the blood, urine and biophysical methods for evaluation of nutritional status do not discredit them. Used appropriately, each kind of method has value. Each has its place; each presents information on a different aspect of nutrition. The numerous articles in the literature describing studies by blood and urine methods attest their utility. For following the quick reflection of dietary habits in the body, for secondary screening of persons without avitaminotic tissue changes, for specific metabolic studies, the blood or

140. Milam and Wilkins.[50]
141. Trier, A. E.: Serumascorbinsyrens Aarstidsvariation, Ugesk. f. laeger. **100**: 10-14 (Jan. 6) 1938.

142. Greenberg, L. D.; Rinehart, J. F., and Phatak, N. M.: Studies on Reduced Ascorbic Acid Content of the Blood Plasma, Proc. Soc. Exper. Biol. & Med. **35**:135-139 (Oct.) 1936.
143. Steven and Wald.[124] Yarbrough and Dann.[124] Hunt and Hayden.[58] Kruse.[58]

urine technic is the method of election. Similarly, for studying dysadaptation and night blindness, the adaptometer is the proper instrument.

The methods which embody gross and biomicroscopic examination of specific tissues for characteristic morphologic changes—the eyes for avitaminosis A and ariboflavinosis, the gums for avitaminosis C and the tongue for aniacinosis—meet most requirements for appraising nutritional status. Particularly they permit both the acute and chronic forms of tissue change in any stage and degree to be detected. True, if the tissue is normal, it is possible that the blood values may be low. This situation, however, is the least frequent in the general population. Such a circumstance would be encountered most often in infants and preschool children. But the biomicroscopic system as a primary screen is so sensitive in detecting the very early or mild form that routine blood values as a secondary screen would add information in only a comparatively small number of instances.

There are still some gaps in the several systems for appraising nutrition. Despite the lack of a few tests, there are now enough for application. Considering the rapid progress in this field, it is to be expected that before long the systems will be rounded out.

PREVALENCE OF MALNUTRITION

Obviously the recorded prevalence of malnutrition depends on the concept, criteria and means of recognizing it. In the past it has been judged by physical measurements or by presence of assorted gross signs, including those of the severe acute type of deficiency disease. Neither method has revealed any considerable prevalence of malnutrition. It is very misleading to rely on them for evidence on the amount of malnutrition. Simple inspection is not sufficiently sensitive to detect mild deficiency states, whether acute or chronic. Most of the chronic changes, even when severe, have not been recognized as specific characteristics of deficiency diseases. These conditions constitute the largest part of malnutrition.

Already the gross and biomicroscopic methods of examining tissue have yielded results indicating a high prevalence of deficiency states.[139] Even in high economic groups there are few people in absolutely perfect nutrition. Yet these results are not surprising. Very few persons have consistently followed throughout life a diet satisfactory in all essentials, escaped the many other causes contributing to a deficiency state or had complete recovery from any impairment of their nutrition. The older the person, the more opportunity he has had for some dietary lapse or adverse influence. Then too the standard of perfection in the tissue is very exacting. And the biomicroscopic method is so sensitive that it is capable of detecting slight abnormalities. From all these considerations, the high prevalence of deficiency diseases is not unexpected.

Taken by and large, most of the malnutrition is chronic, with or without mild acute; some of it is mild, but much is rather severe.[139] This condition too is understandable. Often faulty diets persist for many years.

Some broad generalizations can be drawn about the several states in relation to factors affecting them. Like prevalence, the status of a deficiency disease is influenced by economic level, geographic region and age as well as by lesser environmental factors. Of these three it may be seen that the first two are indexes of the number, nature and degree of dietary deficiencies. Age is again the time factor. In the lower economic groups, deficiency diseases tend to be more numerous, more severe and more advanced than in the higher economic groups. In geographic regions where a particular deficiency disease is endemic the severe acute form is common; in other regions it is rarely seen. In the latter it is mostly in the chronic form. At younger ages deficiency diseases are likely to be less prevalent and mostly in the mild acute or beginning chronic state; at older ages they are apt to be more frequent and largely in the chronic form.

These influences are not invariable, absolute or completely decisive. Economic level and geographic region are far from perfect correlates of deficient diets, and age does not initiate a deficiency disease. Nor are these influences of equal weight. Perhaps the most influential is economic level. But many persons in the higher economic groups do have severe deficiencies, while some in the lower miraculously escape. Only a small proportion of persons in an endemic region come down with a severe acute deficiency disease; almost all of these are in the low income group. As for the influence of age, adults may be normal, whereas children, particularly if they are from low income families, may exhibit a chronic process. We have seen numerous children from 8 to 11 years old and in low economic groups with chronic changes similar to those most frequent in the middle age group.

It is apparent that there is much malnutrition, most of it chronic in character. If we wish to be coldly scientific we can join the skeptic in asking: What of it? What is the justification for the expense and work in examining persons and treating the marginally malnourished? It is appropriate to raise the question whether the mild and chronic forms of malnutrition have any significance. Increasing evidence indicates that they have immediate and that they may also be found to have long range effects.

For one thing, troublesome symptoms occurring in these mild and chronic forms of malnutrition and their disappearance under treatment may be noted objectively. In ariboflavinosis, photophobia and lacrimation are frequently noted during the biomicroscopic examination.[56] Psychic manifestations have been observed in mild athiaminosis.[144] Doubtless, disturbing symptoms will be found in the mild stages of other deficiency diseases. Some are real handicaps. How much these symptoms dull the edge of health and lower performance in daily activities can now only be conjectured. In many instances, only after the symptoms have disappeared is their previous presence appreciated. Relief from such symptoms is no small benefit. The extent to which improvement is reflected in such activities as work remains to be demonstrated. In any event, relief from symptoms may be regarded as one justification for the diagnosis and specific treatment of these mild and chronic states.

INFLUENCE ON MORBIDITY

Moreover, there are many strong intimations, short of proof, that malnutrition has a contributory or determining role in the occurrence of other diseases. This is the much debated question of the influence of nutritional status on morbidity. Up to now the lack of methods has made it difficult to supplant debate by demonstration on whether, or to what extent, impaired nutrition may play a part as a predisposing factor in

144. Williams, R. D.; Mason, H. L.; Wilder, R. M., and Smith, B. F.: Observations on Induced Thiamine (Vitamin B_1) Deficiency in Man, Arch. Int. Med. **66**: 785-799 (Oct.) 1940.

parasitic diseases, such as tuberculosis, and whether satisfactory nutrition may aid in building up natural resistance against such diseases. With the present availability of methods, this very promising and hopeful vista may be explored. However, we must not look for too much from nutrition; we must not expect it to confer absolute protection against disease. Other circumstances, of course, exert their influence. Rather, let us say that nutrition at most may be one factor affecting the probability of disease occurring. If that should be demonstrated it would be sufficiently important to warrant evaluation of nutritional status as a routine procedure.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E. SMITH, M.D., Secretary.

ASCORBIC ACID, U. S. P. (See New and Nonofficial Remedies, 1942, p. 564).

The following dosage form has been accepted:

PITMAN-MOORE COMPANY, INDIANAPOLIS.

Tablets Ascorbic Acid: 50 mg.

DIETHYLSTILBESTROL (See THE JOURNAL, June 20, 1942, p. 635).

The following dosage forms have been accepted:

GEORGE A. BREON & COMPANY, INC., KANSAS CITY, MO.

Ampuls Diethylstilbestrol in Oil, 0.5 mg. per cc.: 1 cc. In vegetable oil.

Ampuls Diethylstilbestrol in Oil, 1.0 mg. per cc.: 1 cc. In vegetable oil.

Suppositories Diethylstilbestrol: 0.5 mg.

Tablets Diethylstilbestrol: 0.2 mg., 0.5 mg. and 1.0 mg.

FREDERICK STEARNS & COMPANY, DETROIT.

Tablets Diethylstilbestrol: 0.1 mg., 0.5 mg. and 1.0 mg.

MENADIONE (See New and Nonofficial Remedies, 1942, p. 584).

The following dosage forms have been accepted:

E. R. SQUIBB & SONS, NEW YORK.

Thyloquinone *(Crystals):* bulk.

Ampuls Thyloquinone in Oil (Intramuscular), 2 mg. per cc.: 1 cc. Each cubic centimeter contains 2 mg. of thyloquinone dissolved in corn oil.

Capsules Thyloquinone in Oil (Oral): Each brown gelatin capsule contains 1 mg. of thyloquinone dissolved in corn oil.

Tablets Thyloquinone: 1 mg.

NICOTINIC ACID AMIDE (See New and Nonofficial Remedies, 1942, p. 562).

The following dosage form has been accepted:

THE UPJOHN COMPANY, KALAMAZOO, MICH.

Sterile Solution Nicotinic Acid Amide: 100 mg., 2 cc.

RIBOFLAVIN (See New and Nonofficial Remedies, 1942, p. 559).

The following dosage forms have been accepted:

ABBOTT LABORATORIES, NORTH CHICAGO, ILL.

Capsules Riboflavin: 1 mg.

Tablets Riboflavin: 1 mg.

SULFANILAMIDE (See New and Nonofficial Remedies, 1942, p. 142).

The following additional dosage form has been accepted:

E. R. SQUIBB & SONS, NEW BRUNSWICK, N. J.

Ampul Sulfanilamide *(Crystals):* 1 Gm.

Council on Foods and Nutrition

ACCEPTED FOODS

THE FOLLOWING ADDITIONAL FOODS HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO ACCEPTED FOODS.

FRANKLIN C. BING, Secretary.

FATS AND OILS (*See* Accepted Foods, 1939, p. 30).

Wilson & Co., Inc., Chicago.

WILSON'S CERTIFIED OLEOMARGARINE AND WILSON'S SAVORY OLEOMARGARINE, FROM VEGETABLE SOURCES WITH VITAMIN A ADDED, an oleomargarine consisting of partially hardened cottonseed oil, cottonseed oil, cultured skimmed milk, salt, emulsifier (manufactured by the firm consisting of diglyceride, with minor amounts of monoglycerides, triglycerides and fatty acids), plus vitamin A concentrate in oil.

Analysis (submitted by manufacturer).—Moisture 15.1%, fat 80.5%, ash 3.11%, protein 0.55%, total carbohydrates 0.74%, sodium chloride 3.0%.

Calories.—7.3 per gram; 207 per ounce.

Vitamins.—The firm has supplied evidence that this product furnishes at least 9,000 U. S. P. units of vitamin A per pound.

Wilson & Co., Inc., Chicago.

WILSON'S CERTIFIED OLEOMARGARINE AND WILSON'S SAVORY OLEOMARGARINE, FROM ANIMAL SOURCES WITH VITAMIN A ADDED, an oleomargarine consisting of oleo oil, oleo stock, cottonseed oil, neutral lard, salt, cultured skimmed milk, emulsifier (manufactured by the firm consisting of diglyceride, with minor amounts of monoglycerides, triglycerides and fatty acids), plus vitamin A concentrate in oil.

Analysis (submitted by manufacturer).—Moisture 15.1%, fat 80.5%, ash 3.11%, protein 0.55%, total carbohydrates 0.74%, sodium chloride 3.0%.

Calories.—7.3 per gram; 207 per ounce.

Vitamins.—The firm has furnished evidence that the product supplies at least 9,000 U. S. P. units of vitamin A per pound.

FOODS FOR SPECIAL DIETETIC PURPOSES (*See* Accepted Foods, 1939, p. 295).

Chicago Dietetic Supply House, Inc., Chicago (distributor).

CELLU GREEN LIMA BEANS, canned green lima beans, packed in water without added sugar or salt.

Analysis (submitted by distributor).—Moisture 77.4%, sucrose, 1.6%, starch 9.55%, crude fiber 1.17%, undetermined carbohydrates, etc. (by difference) 4.8%, ether extract (crude fat) 0.19%, protein (N × 6.25) 4.67%, ash 0.6%.

Calories.—0.85 per gram; 24 per ounce.

FRUIT JUICES INCLUDING TOMATO JUICE (*See* Accepted Foods, 1939, p. 48).

Domino Canning Association, Bradenton, Fla.

DOMINO AND SUNSEALD BRANDS OF BLENDED FLORIDA ORANGE AND GRAPEFRUIT JUICE (SUGAR ADDED), a mixture of Florida orange and grapefruit juices (sweetened).

Analysis (submitted by manufacturer).—Moisture 87.8%, total solids 12.2%, ash 0.5%, fat (ether extract) 0.1%, protein (N × 6.25) 0.5%, crude fiber 0.1%, carbohydrates other than crude fiber but including citric acid (by difference) 11.0%, sucrose 1.5%, reducing sugar (as invert) 8.3%, acid (as anhydrous citric) 1.1%.

Calories.—0.47 per gram; 13.3 per ounce.

Vitamins.—Vitamin C (by titration with 2,6-dichlorophenolindophenol) 36.2 mg. per hundred grams.

PREPARATIONS USED IN THE FEEDING OF INFANTS (*See* Accepted Foods, 1939, p. 156).

Gerber Products Company, Fremont, Mich.

GERBER'S JUNIOR FOODS—APPLE, PRUNE, TAPIOCA PUDDING, a canned cooked mixture of fresh apples, prunes, fresh whole milk, sugar, tapioca, cream (35%) and salt.

Analysis (submitted by manufacturer).—Moisture 73.2%, ash 0.4%, fat 1.0%, protein (N × 6.25) 0.2%, crude fiber 0.8%, carbohydrates (by difference) 24.3%, calcium 0.012%, phosphorus 0.012%, iron 0.0014%.

Calories.—1.07 per gram; 30.4 per ounce.

Vitamins (Reports of assays furnished by firm, 1942).—Vitamin A, 240 I. U. per hundred grams; ascorbic acid, 0.3 mg. per hundred grams.

Paley-Sachs Food Company, Houston, Texas.

MRS. PALEY'S BABY FOODS BRAND—STRAINED BEEF LIVER, a strained mixture of beef liver, water and salt.

Analysis (submitted by manufacturer).—Moisture 76.0%, total solids 24.0%, ash (mineral matter, including salt) 1.4%, fat 3.6%, protein 14.2%, total carbohydrate (by difference) 4.9%, iron 0.0053%, phosphorus 0.097%, calcium 0.003%.

Calories.—1.0 per gram; 29.3 per ounce.

Vitamins.—(Chemical assays submitted by firm).—Each hundred grams furnishes 6,500 international units of vitamin A and 0.035 mg. of thiamine.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, FEBRUARY 27, 1943

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

The thirty-ninth Annual Congress on Medical Education and Licensure, sponsored by the Council on Medical Education and Hospitals of the American Medical Association, was one of the most successful ever assembled. Indeed the results establish the necessity of the assembly in wartime. Elsewhere in this issue appears the contribution made to the congress by Pres. Edward C. Elliott, chief of the division of professional and technical employment and training in the War Manpower Commission; the statement of Brig. Gen. Joe N. Dalton, assistant chief of staff for personnel of the United States Army, describing plans for premedical and medical education as related to the United States Army; the contribution of Dr. Harold S. Diehl of the directing board of the Procurement and Assignment Service for Physicians, Dentists and Veterinarians concerning medical education as related to the procurement and assignment of physicians, and finally a report by Col. George F. Lull, chief of the personnel division of the United States Army Medical Corps, on the utilization of physicians by the Army. Here are the answers to most of the questions which have been disturbing members of the medical profession in recent months.

President Elliott indicates the nature of the problems which confront the War Manpower Commission and emphasizes the fact that education as well as every other aspect of our lives must appreciate the inescapable requirements of global war. Brigadier General Dalton gives in detail an analysis of the premedical and medical programs, the methods by which students will be selected, the curriculums that they will follow, the emoluments that they will receive, the nature of the internship and many other facts about this procedure. Dr. Harold S. Diehl indicates some of the questions which continue to concern educators in medicine. His paper will no doubt bring these questions clearly before the authorities responsible for the ultimate functioning of the program and enable them to act promptly in making every adjustment possible.

Colonel Lull has had one of the most difficult positions in the entire war effort, at least as far as medicine is concerned. The fact that the Army Medical Department had more than 35,000 medical officers on duty at the end of 1942 is an indication of the tremendous task that has been successfully accomplished. His citation of actual communications received from physicians in the service and his explanations of the duties which physicians in the armed forces must fulfil should answer many of the questions which continue to come to all those engaged in meeting the demands for personnel. The use of specialists in the armed forces, the formation of hospital units, the changing curriculum of the Medical Field Service School, the graduate courses now being developed, the use of women physicians and the provision of residents for hospitals are some of the problems which he analyzes and explains. It would be well if all could bear in mind one of his concluding statements:

> When you hear from a disgruntled officer please evaluate his statements before you form an opinion of the entire medical service of the Army. . . . Also remember that there are a lot of medical officers satisfied with their temporary jobs, and most of these do not write to you.

Among other problems discussed at this congress were graduate education and the war and medical licensure. The Surgeon General of the Navy, Rear Admiral Ross T. McIntire, gave a graphic account of the medical services in the South Pacific, and Surgeon General Thomas Parran provided a forecast of some of the medical problems of the postwar period. These additional contributions will be reflected in forthcoming issues of THE JOURNAL.

In his opening statement for the congress, Dr. Ray Lyman Wilbur, chairman of the Council on Medical Education and Hospitals, said in part:

> We must all recognize the difficulty of holding our eager American youths at the task of prolonged medical study when there are other and quicker ways of getting into the fight. So far we seem to have enough premedical students of quality to carry forward this year in our medical schools. The importance of medical training must be pointed out and the definite assignment by the Army and Navy of chosen men to medical schools must be put into effect. To run short of good doctors would be a calamity of the first magnitude. New methods of financing hospital care, new procedures under the auspices of the medical profession for medical care are constantly appearing. These with the changes in normal life due to the war are putting new responsibilities on every physician in the land. Modern science applied to human living has done more for our comfort and safety in the last fifty years than in all of the ages preceding. We must enter on our share in the war with the firm resolve to give all that medicine offers, but with an even firmer resolve not to lose what we have won in the battle against disease and ignorance. Whatever the calls on us, we must see that medicine advances during the war and that it goes back at least to our highest level of achievement when the bombs stop dropping.

American medicine has performed remarkably in meeting the demands placed on it for the war effort. The officials of the government and officers of the armed

forces who have been charged with the task of providing for medical care have been sympathetic to the needs of medical education and of civilian medical practice. The accomplishment of the Council on Medical Education and Hospitals in providing at this congress statements from authoritative sources as to present plans and changes contemplated for the future in medical education and in medical practice merits the appreciation particularly of medical educators, since it stabilizes definitely a situation full in recent months of apprehensions and doubts.

IMMERSION BLAST INJURIES

The mechanism of the effects of blast in water is that of a single wave of pressure, the reflected wave from the sea bottom being of little importance. The pressure wave in water travels at the same speed as it does at first in air. However, the rate of fall of pressure is much slower than in air and varies directly with the distance; hence pressure effects will be expected over much greater distance. Williams,[1] in his Hunterian Lecture, pointed out that the human body has roughly the same density as water. When the pressure wave impinges on the water there will be no reflection, but the force will be transmitted through the tissues without displacement just as if the body were so much water. However, when the transmitted force encounters a cavity in the body containing air, for example the lungs, the static wave of pressure will change into a wave of kinetic energy in the layers of tissue lining that cavity and a disruptive effect will occur. This apparently explains why the lungs and other gas filled cavities in the body are particularly susceptible to damage from the pressure wave, even though the body itself may not be deeply immersed.

Cameron and his associates[2] subjected goats, monkeys and dogs to the explosion of a 320 pound charge of trinitrotoluene suspended at 48 feet in water of 90 feet. The animals were buoyed up by inflated rubber tires round their necks and were secured to a line at various intervals. Studies of pathologic changes in animals thus exposed revealed severe pulmonary hemorrhages and interstitial emphysema, sometimes hemorrhage in the wall of the alimentary tract, occasionally hemorrhage in the epicardium, spleen, kidneys and ductless glands. Little damage was produced in the soft structures of the body wall and the bones.

Effects of immersion blast on man are also discussed in a symposium published in the January issue of the *United States Naval Medical Bulletin*. Observations on 35 patients treated at a naval hospital form the basis for the report. According to Lieutenant Commander Palma and Lieutenant Uldall[3] the severity of the symptoms depended on the distance of the men from the source of the explosion and on their own relative position in the water, whether horizontal or perpendicular, facing the blast or with their backs turned. From ten to forty-five minutes after the explosion the ones that were facing the blast or swimming in the prone position began to develop abdominal symptoms varying in degree from mild intermittent cramps to severe continuous abdominal pain. Several vomited and developed diarrhea. Many had hemoptysis lasting from twelve to twenty-four hours. The group that had their backs toward the blast or who were swimming in the supine position developed similar abdominal symptoms but to lesser degree, and their signs and symptoms were principally in the chest. Of the entire group only 14 had signs and symptoms of severe injury, the signs being chiefly those of shock and peritonitis. Physical signs in the chest were more often absent than present, but roentgenograms revealed in all but 1 case slight to moderate areas of increased density at one or both bases. Treatment was symptomatic and expectant, with the employment of sulfadiazine. In this group 6 recovered completely without an operation, 2 are recovering without an operation, 2 are recovering after surgical interventions and 4 died. Postmortem observations by Lieutenant Commander Ecklund[4] in the 4 fatal cases revealed severe intra-abdominal lesions in each instance without any external evidence of injury. Sections from lungs showed extensive hemorrhage into the alveoli and rupture of the alveolar walls. Much the same observations were made by Cameron and his associates in their animal experiments. From these observations it appears that the principal seat of trauma in atmospheric blast is in the thoracic cavity, whereas the predominating injuries in immersion blast are abdominal.

Neurologic observations were, under the circumstances, limited and unsatisfactory, and microscopic studies of the central nervous system were not made. Lieutenant Hamlin[5] suggests in his discussion that a blast wave of sufficient magnitude may be transmitted to the spinal canal and thence to the cranial cavity, setting up a convection force in the cephalad direction through the spinal fluid and possibly the neuroaxis itself, which may be analogous to the phenomenon of cerebral acceleration that follows a blow to the head. Such a mechanism could damage the supporting vessels of the leptomeninges, giving rise to subarachnoid hemorrhage and neurologic symptoms.

More complete knowledge of the extent and mechanism of the lesions caused by immersion blast injuries

1. Williams, E. R. P.: Blast Effects in Warfare, Brit. J. Surg. **30**: 38 (July) 1942.
2. Cameron, G. R.; Short, R. H. D., and Wakeley, C. P. G.: Pathological Changes Produced in Animals by Depth Charges, Brit. J. Surg. **30**: 49 (July) 1942.
3. Palma, Joseph, and Uldall, J. J.: Immersion Blast Injuries, U. S. Nav. M. Bull. **41**: 3 (Jan.) 1943.
4. Ecklund, A. M.: The Pathology of Immersion Blast Injuries, U. S. Nav. M. Bull. **41**: 19 (Jan.) 1943.
5. Hamlin, H.: Neurological Observations on Immersion Blast Injuries, U. S. Nav. M. Bull. **41**: 26 (Jan.) 1943.

will be forthcoming from more thorough postmortem observations, preferably from immediately fatal cases, and from animal experiments. Such experimental studies are now in progress.

RESENSITIZATION OF SULFONAMIDE FAST BACTERIA

Encouraging new facts point toward successful therapeutic control of sulfonamide fast infections. Under certain test tube conditions or as a result of unsuccessful sulfonamide therapy numerous pathogenic bacteria acquire a tolerance or resistance to one or more of the sulfonamide compounds. They become able to multiply normally in the presence of the usual bacteriostatic concentration of these agents. Sulfonamide fast infections often do not yield to many times the usually successful therapeutic dose of sulfanilamide, sulfadiazine or sulfathiazole. Generally this acquired sulfonamide fastness is believed to be due to increased production by the organisms of sulfonamide inhibitors. This theory is in line with the fact [1] that bacterial extracts often contain a proliferative coenzyme ("P factor") which may be present in sufficient amounts to neutralize the bacteriostatic effects of sulfonamide compounds. Numerous known chemical substances also function as antisulfonamides, prominent among them being methionine and p-aminobenzoic acid.[2]

If increase in this P factor is the sole explanation of acquired sulfonamide fastness a logical method of overcoming this fastness would be to use some substance that would neutralize, inhibit or otherwise overcome the growth promoting action of this factor. Tsuchiya, Tenenberg and others [3] of the Department of Bacteriology, University of Minnesota, found in early studies that the antisulfonamide action of methionine or of p-aminobenzoic acid can be overcome by the use of urea. In itself the inhibiting concentration of urea did not have demonstrable effect on the rate of bacterial growth. Tsuchiya and his colleagues [4] have now tested whether or not similar concentrations of urea would have the same effect on sulfonamide resistant micro-organisms (P factor).

Three sulfonamide fast strains of Staphylococcus aureus were tested. One of these had been made sulfonamide fast in vitro and the two other strains were isolated from clinical cases which had failed to respond to prolonged sulfathiazole therapy. Using Gladstone's [5] basal synthetic medium they found that addition of 60 mg. of sodium sulfathiazole per hundred cubic centimeters did not have bacteriostatic effect on these three refractory strains. Inhibition of the normal growth rate was not seen when from 1.25 to 1.75 per cent of urea was added to the synthetic medium. A combination of 60 mg. of sodium sulfathiazole per hundred cubic centimeters and from 1.25 to 1.75 per cent of urea, however, often reduced the growth rate to one one-hundredth and at times to one one-thousandth of normal. Whatever may be the ultimate explanation of the nature of sulfonamide fastness, use of this urea-sulfonamide combination overcomes that fastness and renders the organisms resusceptible to sulfonamide bacteriostasis.

In evaluating their results it must be emphasized that thus far their "urea resensitization" has been demonstrated only for one sulfonamide compound, for one microbic species (Staphylococcus aureus) and only when it is grown in a relatively simple synthetic medium. There is no assurance of a similar synergic action with other sulfonamide compounds, other microbic species or on organisms suspended in serum, exudate or other body fluids. In vivo tests have not thus far been reported. Nevertheless the newly described combined action of urea and sulfathiazole is a discovery of basic clinical interest, since it introduces a new concept in chemotherapy. The practical applications may in time be extended to numerous micro-organisms now considered refractory to sulfonamide drugs. The promised clinical report [6] of the first practical applications of the new urea-sulfathiazole combination to human cases will be awaited with interest.

1. Green, H. N.: Brit. J. Exper. Path. **21**: 38 (Feb.) 1940.
2. Dubos, R. J.: Ann. Rev. Biochem. **11**: 659, 1942.
3. Tenenberg, D. J.; Tsuchiya, H. M.; Clark, W. G., and Strakosch, E. A.: Proc. Soc. Exper. Biol. & Med. **50**: 262, **51**: 245, 1942.
4. Tsuchiya, H. M.; Tenenberg, D. J.; Strakosch, E. A., and Clark, W. G.: Proc. Soc. Exper. Biol. & Med. **51**: 245 (Nov.) 1942.
5. Gladstone, G. P.: Brit. J. Exper. Path. **20**: 189 (April) 1939.
6. Strakosch, E. A., and Clark, W. G.: Minnesota Med., to be published.

Current Comment

MEDICAL ACTIVITIES OF COMMONWEALTH FUND IN 1942

Current support of the Commonwealth Fund [1] in medical research is chiefly directed toward work which promises direct usefulness to war medicine, to investigations which offer significant contributions to the physiologic bases of medicine and to those which rest on long continued consecutive observation that cannot be interrupted without letting partly won facts slip out of reach. In medical education the special interest of the fund has been to help medical schools to make the most of the facilities at hand without gross enlargement of departmental budgets or capital outlay. Services on the borderline between psychiatry and pediatrics and the provision of opportunities for training in psychiatry continue to be the principal contributions of the fund toward the promotion and maintenance of mental health in this country. In addition, the fund cooperated in public health studies and has continued its rural hospital programs. The disbursements of the fund in these fields of medical interest in 1941-1942 exceeded $1,200,000.

1. The Commonwealth Fund, Twenty-Fourth Annual Report of the General Director, Sept. 30, 1942, New York, January 1943.

DURATION OF IMMUNITY FOLLOWING YELLOW FEVER VACCINATION

Since 1937 it has been possible to employ relatively safe vaccination against yellow fever by means of attenuated yellow fever virus unaccompanied by immune serum. This resulted from the development of a modified strain of virus (17D) which no longer produced either the visceral lesions of yellow fever or fatal encephalitis in rhesus monkeys. The duration of immunity following infection with 17D virus, however, previously had been studied on only a small scale and for periods not exceeding three years. Now Fox and Cabral[1] report large scale observations on the duration of immunity to yellow fever after vaccination with 17D virus over a four year period as determined by mouse protection tests. The persons included in their study all belonged to one or another of several well defined vaccination groups. Altogether 926 persons were studied, the total being composed of several large groups vaccinated at various intervals over this four year period. Recently collected serums and serums collected from the same persons soon after vaccination were examined for their protective action in mice and the results were compared. Some inconsistencies were observed. The evidence indicated that these variations were not due to previously unrecognized differences in the antigenicity of the 17D substrains concerned but rather to the different age compositions of the vaccination groups. Thus, only 4 (2 per cent) serums collected four years after vaccination from groups chiefly composed of adults failed to show some indication of protective action. In contrast, 36 (nearly 10 per cent) of serums collected two and three years after vaccination from groups largely composed of young persons were without protective power. Those serums which did not show protective action in the routine tests were reexamined by a more sensitive technic by which means detectable antibodies were revealed in 86 (61.8 per cent) of the 139 serums reexamined. These observations suggest that serologically demonstrable immunity against yellow fever induced by living 17D virus may completely disappear in some cases. Fox and Cabral also considered the significance of the low degrees of serologic immunity and showed that such low level immunity probably is sufficient to prevent reinfection with the 17D strain to which, in spite of its lack of virulence, man is highly susceptible. Finally, their observations on the duration of immunity following vaccination are of special significance with regard to the systematic prophylaxis of yellow fever. Thus vaccination of an adult population with a virus of established antigenicity results in the persistence of an immune state which is clearly satisfactory from the group standpoint for at least four years and probably longer. In children after vaccination the level of protective antibody does not rise as high as in adults and tends to fall more rapidly. As these investigators point out, whether or not the immunity of children conferred by vaccination is relatively lower in degree and whether therefore the vaccination needs to be repeated after a shorter interval remains to be determined. Meanwhile this evidence of the reasonably persisting immunity from vaccination to yellow fever in adults is extremely welcome.

1. Fox, J. P., and Cabral, A. S.: The Duration of Immunity Following Vaccination with the 17D Strain of Yellow Fever Virus, Am. J. Hyg. 37:93 (Jan.) 1943.

FITTING HANDICAPPED WORKERS TO JOBS

Industry, which in normal times has been loath to employ the handicapped worker, is now recognizing that many handicapped persons may be as efficient as those with full physical equipment and may be safer workers if they can be properly placed, trained and supervised. *Manpower Review*,[1] a publication of the War Manpower Commission, has recently considered the use of handicapped persons in industry as an aid to the war effort. The fitting of a handicapped person to his job demands that there be a breakdown of the requirements for all jobs in specific relationship to the exact procedures required, such as the degree of skill and strength demanded and working conditions which surround the job. Dovetailing with the detailed job analysis there must be an equally detailed analysis of the capability of the worker. When these frameworks of information have been established, adaptation of the handicapped person to the job becomes relatively simple. Adaptations of machinery may be made, such as shifting hand or foot levers so that they can be used by workmen with missing hands or feet. From Germany comes a report concerning measuring devices which use variations in tonal qualities of sound, such as a bell to enable blind workers to "read" the instrument. Persons unable to stand or walk much may be placed in sedentary jobs to which all material is brought and from which finished products are taken away by other workers or conveyors. A sample job analysis sheet indicates the demands for walking, standing, sitting, climbing, crawling, stooping, kneeling, lifting, pulling, pushing, using one foot, using two feet, using one hand, using two hands, using fingers, seeing, talking, hearing and working speed for such industrial operations as operating presses, gage and weight machines, hardening furnaces, inspection jobs, molders, loaders and the like and also classifies these jobs according to such working conditions as outside, inside, hot, cold, humid, wet, dry, dusty, fumes, noisy, dirty. A tabulation of the estimated number of persons with various types of impairment by types of preemployment service needed indicated 901,000 with hearing impairment, 337,000 blind in one or both eyes, 1,849.000 with orthopedic impairment, 1,186,000 with hernia, 976,000 with hemorrhoids and more than 11,000,000 with chronic diseases. This list was based on an estimate by the United States Public Health Service. The latent manpower in these handicapped workers can be significant in the war effort. The physician, particularly the industrial surgeon, management and labor can cooperate in the constructive utilization of this vast potential reserve.

1. Manpower Review, January 1943, War Manpower Commission, Washington, D. C. (circulated to War Manpower Commission officials only).

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession.

ARMY

THE TREATMENT OF BURNS

Circular Letter No. 15 of the Office of the Surgeon General is concerned with the treatment of burns. It was issued on January 11 to all medical officers of the United States Army. The suggestions which follow are therefore recommended as routine in the army medical service:

1. *General.*—Burns, as discussed in this paragraph, include all cases with damage of the skin and underlying tissues due to heat, chemicals or electricity.

2. *Fundamentals of Treatment.*—(*a*) The prevention and control of shock is the primary consideration in the management of every burn.

(*b*) Proper prophylactic measures against pyogenic infection, tetanus and gas gangrene should be taken. Satisfactory end results, that is, minimal scar formation, largely depend on the avoidance of pyogenic infection; the moist surfaces of burns provide ideal conditions for bacterial growth, and it is therefore of paramount importance to employ, if possible, strict aseptic technic in operating on and dressing burns.

(*c*) Measures should be taken to relieve pain.

3. *Treatment.*—(*a*) General: (1) Proper steps for the prevention or treatment of shock should be instituted. In the presence of extensive burns quantities of plasma up to 12 units may be required during the first twenty-four hours. If available, concentrated normal human serum albumin in appropriate amounts may be used likewise. Transfusion of fresh whole blood is often needed to combat the rapidly developing severe anemia which follows extensive burns; when anemia exists, whole blood transfusion is particularly indicated as a preliminary to skin grafting. Parenteral fluid replacement other than that attained by means of plasma or whole blood transfusion should be accomplished by means of 5 per cent dextrose in sterile distilled water. The intravenous administration of sodium chloride solution should be reserved for those burn cases in which mineral depletion is pronounced, as when great loss of electrolytes occurs as a result of persistent vomiting.

(2) In all cases of moderate to severe burns prophylactic chemotherapy should be administered. Sulfadiazine is the drug of choice (sulfanilamide may be substituted) with an initial dose of 4 Gm. (60 grains). Subsequent doses of sulfadiazine should be given only under the direction of a medical officer. It should be kept in mind that, although sulfonamide therapy may serve to prevent infection, great care must be exercised in employing such therapy in burn cases. The extensive fluid loss and possible kidney damage so common in burn cases increase the danger of renal complications from sulfonamide therapy. Maintenance doses of sulfadiazine should be given in 0.5 Gm. (7½ grain) doses every four hours until such time as adequate kidney function can be demonstrated, under which circumstance the dosage may be increased to 1 Gm. (15 grains) every four hours.

(3) Prophylaxis against tetanus is indicated for all patients with second or third degree burns.

(4) A prophylactic dose of gas bacillus antitoxin may be given at the discretion of the medical officer.

(5) Pain should be relieved by adequate doses of morphine. Pain resulting from an extensive burn can ordinarily be relieved by a dose of ½ grain of morphine. In the presence of pronounced anoxia large doses of morphine are dangerous, and under such circumstances the dose should not exceed ¼ grain.

(*b*) First Aid or Emergency Treatment of the Burned Area: (1) The burned surface should be covered with a liberal amount of boric acid ointment or, if this is not available, with petrolatum. The burn should then be covered with strips of a sterile fine mesh gauze (44 mesh gauze bandage is satisfactory). Over this should be added a smooth thick layer of sterile gauze dressing (large or small first aid dressings are especially suitable for this purpose). Finally, a gauze or muslin bandage should be firmly applied over the dressings.

(2) Contamination of burned surfaces by organisms from the nose and throat is responsible for most of the more serious infections which subsequently develop. Therefore, to minimize contamination from this source, masking should be practiced by the surgeon and assistants. If masks are not available, mouths should be kept closed.

(3) The prompt administration of plasma, when feasible, constitutes an important element in the emergency treatment of burns.

(*c*) Definitive Treatment of the Burned Area: The burned area should be treated as follows, standard operating room technic, if possible, being employed, with the patient, as well as all attendants, fully masked.

(1) Ether, benzene, lard or other detergents should be used to remove grease, if present. The burned area and then, separately, the surrounding skin are to be carefully cleansed, using neutral soap and water; green soap should not be used. Avoid the use of brushes in the cleansing of the burn.

(2) All blisters and loose shreds of epidermis are carefully removed, and this material is saved for bacteriologic study, if feasible. Skin that gives evidence of irreparable damage through its full thickness should be excised (evidence of irreparable damage to deeper layers of skin may not be apparent for several days, and excision in such cases should be done as a secondary procedure). The resulting wound should be handled like any other open surgical wound, primary grafting of skin being carried out if conditions permit. For painful surgical procedures or dressings, general anesthesia, preferably obtained by intravenous injection, should be employed.

(3) Burns of surfaces of any portion of the body may be treated with boric acid ointment. After thorough surgical cleansing, the burned area should be covered with a generous application of boric acid ointment. Strips of a fine mesh sterile gauze (44 mesh gauze bandage is satisfactory) should be applied. Over this should be added a smooth, thick layer of sterile dressing; this may consist of gauze, absorbent cotton, cotton waste or cellulose. The dressings should be held in place by an evenly and firmly applied bandage; stockinet or some form of elastic bandage is more effective than the ordinary roller bandage. The dressing should not be disturbed for ten days unless complications develop. Firm pressure is especially important in the case of burns of the hands and face. Immobilization of the part by splinting should be effected when feasible.

(4) As an alternate method of definitive treatment, burns of all surfaces except those of the hands, face, genitalia and those involving the circumference of an extremity may be treated with tannic acid and silver nitrate. This method, however, should not be employed in the instance of burns which are grossly contaminated or in which twelve or more hours have elapsed since the receipt of the burn. A freshly prepared 10 per cent aqueous solution of tannic acid is sprayed over the burned area. This

is followed immediately by spraying the area with a mixture of equal parts of 10 per cent tannic acid and 10 per cent silver nitrate solutions. This mixture should then be sprayed on the burn every half hour until a satisfactory eschar has been formed. Care should be taken to avoid spraying normal skin about the wound. While drying, the burned area may be kept exposed to the air in a heated cradle. After the eschar is dry, it may be covered by a dry sterile dressing. In the absence of infection, the eschar should be allowed to separate spontaneously. If infection develops, the eschar must be removed from the entire infected area, and the latter should then be treated like any other infected wound, with the employment of appropriate systemic and local therapy.

(5) Isotonic solution of sodium chloride has been found useful in the treatment of burns involving the face, hands and especially fingers, the flexures and the perineum. It may also be used for the treatment of surface infections following the removal of eschars produced by tannic acid or other agents. Saline solution may be employed in the form of packs or baths.

SILVER STAR AWARDED TO LIEUTENANT HAVLIK

Lieut. Aloysius J. Havlik, M. C., U. S. Naval Reserve, formerly a practicing physician at Tama, Iowa, was awarded the Silver Star for distinguished service as medical officer aboard a destroyer during the battle north of Santa Cruz Islands on Oct. 26, 1942. Lieutenant Havlik's wife, who is now at Audubon, Iowa, writes that her husband has been on destroyer service since May 8, 1942. The award was made February 6 by Admiral W. F. Halsey. The citation was as follows:

In the name of the President of the United States, the Commander of the South Pacific Area and South Pacific Force takes pleasure in presenting the Silver Star Medal to: Lieutenant Aloysius J. Havlik, Medical Corps, U. S. N. R., "For distinguished service in the line of his profession as Medical Officer aboard a destroyer in action against the enemy during the battle to the northward of Santa Cruz Islands on Oct. 26, 1942. While his ship was being subjected to a determined enemy aerial attack, Lieutenant Havlik, with utter disregard for his own personal safety coolly and efficiently sought out and cared for the wounded wherever they might be. His actions were in keeping with the highest traditions of the Naval Service."

SCHOOL OF MILITARY GOVERNMENT AT CHARLOTTESVILLE

The Army opened a school of military government at the University of Virginia at Charlottesville, May 11, 1942, where officers are trained for future detail with military government and liaison and to assist commanders in foreign fields in their relations with the civilian population. The commandant of the school is Brig. Gen. Cornelius W. Wickersham, a son of the former Attorney General and a graduate of Harvard College of Law School, who practiced law in New York City. General Wickersham served on the Mexican border and during the first world war in France, where he was awarded the Distinguished Service Medal and the French Legion of Honor, and later as chief of staff of the seventy-seventh division organized reserve.

The University of Virginia offered its facilities and the privileges of its library. The school uses lecture rooms in the law school building as well as a building for administration. The first four months' course of study was attended by sixty student officers and the second course by one hundred and fifty student officers, among whom were fifteen medical and sanitary corps officers. Among other members of the faculty of the School of Military Government are Col. Frank H. Hastings, C. A. C., assistant commandant; Major Hardy C. Dillard, A. U. S., director of instruction, and Profs. Arnold Wolfers of Yale, Henry Rowell of Johns Hopkins and Hugh Borton of Columbia, who will assist the permanent faculty. Special lectures have been given by two former judge advocates of the Army, Major Generals Blanton Winship and E. A. Kreger, and by Profs. Charles C. Hyde and Phillip C. Jessup of Columbia, Max Lerner of Williams, W. Y. Elliott of Harvard, N. J. Sypkman of Yale, President Isaiah Bowman of Johns Hopkins and Dr. David A. Lockmiller of Duke. Courses are given in international law, public administration, army organization, military government, liaison functions and duties, and study of the politicomilitary backgrounds of enemy countries. Another class reported for training on January 9.

COURSES TO ORIENT MEDICAL OFFICERS FOR THE AIR FORCES

A course is given at the Army Air Forces Officer Training School in Miami Beach, Fla., for the purpose of orienting medical department officers coming from civilian life and to prepare them for duty for the army air forces. This course is similar to the regular officer training school courses given for the air forces and yet varies in some respects to meet the special needs of medical department personnel. The military training given to the medical department officers is the same as that given by the army air forces officers. The academic training is given in subjects peculiar to the medical department. The medical department student officers have composed about one third of the student body of the officer training school since last November and they have frequently taken the military and academic honors. One of the first ten honor students in class 1942-R was Capt. Carl M. Binnig of Westfield, Mass. The training of the medical officers at the army air forces training school, Miami Beach, is under the supervision of Major Sidney Davidson, M. C.

COLONEL GILLESPIE AWARDED DISTINGUISHED SERVICE MEDAL

The War Department has announced that Col. James O. Gillespie, M. C., U. S. Army, who was chief of the medical service at the Sternberg General Hospital in Manila at the outbreak of the war, has been awarded the Distinguished Service Medal for developing hospitals on Bataan Peninsula with only "extremely limited personnel and equipment." Colonel Gillespie is said now to be a prisoner of war, held by the Japanese at Camp Tarlac, formerly Camp O'Donnell, some 65 miles north of Manila. In the absence of her husband, the medal was presented to Mrs. Gillespie by the commanding general of the ninth service command. Colonel Gillespie is a native of North Dakota, an honor graduate of the University of Minnesota Medical School and a graduate of the Army Medical School, Washington, D. C., and of the Medical Field Service School at Carlisle Barracks, Pa.

AVIATION PHYSIOLOGISTS

A class of aviation physiologists graduated at the School of Aviation Medicine in Texas on January 23. The course, which is of several weeks' duration, treats of the effects of lowered barometric pressure, the effect of flight on man, the operation of low pressure chambers, the theory and practical use of oxygen equipment and the conduct of high altitude indoctrination and classification. Among the graduates were the following medical officers: First Lieuts. Kyle T. DeYarman, Morning Sun, Iowa; Bernard B. Grossman, Corpus Christie, Texas; Arch C. Koontz, Woodsboro, Texas; John Meyers, Worcester, Mass.; Louis Miller, Cleveland; Samuel Schwartzberg, San Antonio, Texas; Capts. Vernon C. Kenney, Chagrin Falls, Ohio, and Clarence R. Schmidt, Seattle, and Major James H. Hammond, Tulsa, Okla.

ARMY AIR FORCE MEDICAL DEPARTMENT OFFICERS GRADUATE

Another class of student officers at the Officer Training School for Army Air Force Medical Department Officers graduated on January 9 at Miami Beach, Fla. Medical department officers comprised about one third of the graduating class of more than six hundred officers. Four medical officers were among those who graduated with distinction. The top man of the entire class was First Lieut. Milton Elkin, Boston, and among the ten highest in the class were First Lieuts. Milton L. Berg, Perry J. Culver and John Homans Jr., all of Boston.

NAVY

RETIRED NAVAL MEDICAL OFFICER COMMENDED

The Navy Department announced on January 24 the award of a letter of commendation to Lieut. Comdr. Marvin M. Gould, M. C., U. S. Navy, retired, for his services in caring for victims of the Cocoanut Grove fire in Boston on Nov. 28, 1942. The citation reads:

"The Department has been informed that on the occasion of the fire in the Cocoanut Grove, Boston, Mass., on November 28, 1942, you assumed charge and directed the work of naval medical personnel, not only at the scene of the fire, but also at hospitals and mortuary. Under your direction, medical assistance was given to civilians and to members of all branches of the armed forces, with the result that pain and suffering were relieved quickly and effectively and the lives of many saved. For the skill, endurance, tact and devotion to duty displayed on this occasion, you are hereby commended."

Dr. Gould was retired in 1939 and ordered back to active duty in 1940. He graduated from the University of California Medical School in 1916 and is at present assigned to the Boston Navy Yard.

DR. W. B. MacCRACKEN AWARDED NAVY CROSS

Dr. William B. MacCracken II of Berkeley, Calif., was recently awarded the Navy Cross by the Commander in Chief of the Pacific Fleet, Admiral Chester W. Nimitz, in the name of the President of the United States. The citation read as follows:

"For extraordinary heroism and devotion to duty in actual conflict with the enemy as Senior Medical Officer of the landing force of the Marine Raider expedition against the enemy held island of Makin on Aug. 17-18, 1942. When the first air attack was made, he personally carried many of the wounded to positions of greater safety. His utter lack of concern for personal safety not only enabled him to give early and effective aid to the wounded but served as an inspiration to all. During the first attempt at evacuation his boat overturned, endangering the life of a seriously wounded private, who was unable to help himself. He saved the life of this man by keeping his head above water and swimming ashore with him. After returning to the ship he performed six major operations under the most difficult conditions and succeeded in bringing all his cases back to the base in excellent condition. His courage and devotion to duty are in keeping with the highest traditions of the naval service."

THE NAVY'S WEEKLY NEWS

The Office of the Surgeon General of the Navy began on February 8 the publication of the *Weekly News,* which is designed to be a medium of value to the personnel of the Bureau of Medicine and Surgery of the Navy, and to enhance the functional activity of the bureau by keeping the various divisions and sections abreast of changes, proposals and advances. The effort of all personnel of the Bureau of Medicine and Surgery in making the *Weekly News* the unifying link of the various sections and divisions of the bureau is much desired. The first issue contains a list of the speeches and conferences to be given or attended by members of the bureau, information concerning appointments in the bureau, visitors, and the increase in hospital facilities expected during the coming year.

HOSPITAL CORPS WAVES

The Surgeon General of the Navy has requested from the Bureau of Naval Personnel the procurement of 5,800 Hospital Corps Waves for assignment to continental activities in order to make available for sea duty hospital corpsmen who are now assigned to shore duty. These Wave members of the Navy Hospital Corps are enlisted as apprentice seamen V-10, U. S. Naval Reserve, and then undergo a routine period of indoctrination at Wave schools, following which they are advanced to hospital apprentice ratings and transferred to the Naval Medical Center, Bethesda, Md., to the Naval Hospital, San Diego, Calif., or to other naval hospitals for further indoctrination and duty. The first groups of Wave technicians have arrived at San Diego and Bethesda.

In addition, thirty-eight Yeomen Waves have been requested for assignment to the Bureau of Medicine and Surgery as replacements of hospital corpsmen and are expected to arrive at the bureau about March 15.

NAVY HOSPITAL FACILITIES

Existing naval hospitals in the United States and the current construction program will provide about 40,000 beds by June 30. The expansion planned for the year 1944 is 20,000 additional beds in hospitals by acquisition of existing structures such as hotels, by expansion of present hospital facilities and possibly by construction of new naval hospitals at various places. The neuropsychiatric section has recommended additional hospitals for the care and treatment of casualties returning from combat areas and ships, suffering from nervous manifestations in conjunction with fatigue and exhaustive states, according to the *Bureau of Medicine and Surgery Weekly News.*

CIVILIAN DEFENSE

NEW AIR RAID WARNING SIGNAL SYSTEM

As a result of studies made by the War Department in the Office of Civilian Defense, a new system of air raid signals became effective February 17 for the Eastern Defense Command, which includes Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Pennsylvania, Maryland, Virginia, North Carolina, South Carolina, Georgia and Florida east of the Apalachicola River. The remainder of the country is not affected; however, the Office of Civilian Defense, Washington, D. C., recommends that the states between the Eastern Defense Command and the Western Defense Command adopt the new regulations of the Eastern military area.

The principal features of these new regulations are: 1. A preliminary "Blue" signal consisting of a long steady blast on an air raid siren, horn or whistle, lasting about two minutes and meaning "Probability of enemy air raid. Enemy planes appear to be headed in your direction. Get ready." 2. A "Red" air raid signal consisting of a series of short blasts on air raid horns or whistles or the warbling notes of the siren meaning "Enemy planes are practically overhead." 3. A "Blue" signal will always follow each "Red" signal after the immediate danger has passed. The community is thus prepared to return to the "Red" without delay if the enemy raiders return. 4. No audible "All Clear" signal is prescribed. The "All Clear" will be indicated by turning on those street lights which have been off during the "Blue," by public radio announcements and telephone, or other communications with warden posts, and by local police. Further details of this new air raid warning signal system will be found in Operations Letter No. 107 of the Office of Civilian Defense, issued January 28.

EMERGENCY MEDICAL SERVICE IN PERRY COUNTY

The Perry County (Ky.) Medical Society, cooperating with the local civilian defense council, has appointed Dr. L. C. Coleman medical auxiliary officer to supervise the emergency medical organization modeled after the plan suggested by the Office of Civilian Defense and comprising eighteen casualty stations, four-

teen of which are in rural parts of the county and four in the cities of Hazard and Lothair. The purpose of the casualty stations is to receive the injured in case of air raid or flood, epidemic, fire or explosion, to treat the less seriously injured and to send to hospitals the more seriously injured. The plan further provides for other local physicians and nurses to report at designated stations in case of a serious emergency.

COURSE ON MEDICAL ASPECTS OF CHEMICAL WARFARE

The Office of Civilian Defense sponsored at Northwestern University Medical School, Chicago, January 14-16, an instructors' course for civilian physicians on the medical aspects of chemical warfare. Among the many demonstrations and classes was a gas mask drill and a gas chamber exercise conducted at Navy Pier by Capt. N. H. Fritz of the chemical warfare service, sixth service command, and by Lieut. John Pabst, U. S. Navy, respectively. Among the other instructors were officers from Great Lakes Naval Station, the local office of civilian defense and from Johns Hopkins University School of Medicine, the University of Chicago and Northwestern University.

NURSING AND THE EMERGENCY MEDICAL SERVICE

The Medical Division of the Office of Civilian Defense is organized along the following functional lines: field casualty service, hospital care, nurse service, blood plasma production and distribution, rescue-first aid, gas defense, sanitary engineering, plant protection and scientific research. The Medical Division recently issued Bulletin No. 6, which summarizes the work of the nursing service and of the emergency medical service and that of volunteers in health, medical care and nursing. This bulletin contains also official information concerning the U. S. Citizens Defense Corps, the U. S. Citizens Service Corps, the Civilian Defense Auxiliary Group, home water supply precautions, protection against injury from war gases, and insignia, identification and dress for nurses.

MISCELLANEOUS

PHYSICAL THERAPY EQUIPMENT UNDER STRICT CONTROL

Physical therapy equipment was placed under strict control, February 16, by the Director General for Operations with the issuance of an order limiting its production and distribution. The order prohibits the manufacture of all types of physical therapy equipment except surgical diathermy units, electric bakers, fever cabinets and other items which it specifically names. The prohibition, however, does not extend to approved purchase orders for the armed services or for Lend-Lease purposes. All manufacturers of physical therapy equipment must file monthly production and shipping schedules on WPB Form PD-774. While the items specifically named are not placed under production limitations, their sale or delivery is subject to strict control and permissible only on purchase orders for the armed services, Lend-Lease, Board of Economic Warfare, hospitals or medical departments of industrial concerns. Items that cannot be manufactured hereafter may be distributed without restriction until present stocks are exhausted. Examples of items of this kind are vibrators, sun lamps and other heat applicators widely distributed through drugstores and similar retail outlets.

The order affects all distributors or dealers handling those items whose delivery is restricted and about twelve large and twenty-five smaller manufacturers of all types of equipment.

EYE GLASSES AND PRICE REGULATION

Definitions of the extent to which maximum prices are established on services rendered in connection with the examination of eyes for glasses were issued February 13 by the Office of Price Administration, which laid down these rules as controlling:

1. All sales of eye glasses and spectacles are subject to the General Maximum Price Regulation, under which ceilings are the highest prices prevailing in March 1942.

2. The charges to a person for services involving the examination and refraction of eyes are not subject to the General Maximum Price Regulation if the seller is not selling corrective eye glasses or spectacles to that person, either as part of the same transaction or as part of the same general course of dealing.

3. If a seller is rendering to any person services involving the examination and refraction of eyes and he is also selling corrective eye glasses or spectacles to that person, either as part of the same transaction or as part of the same general course of dealing, the following rules apply:

(*a*) If the seller makes a single charge for the sale of both the glasses and the services, the joint sale is subject to the General Maximum Price Regulation.

(*b*) If the seller makes a separate charge for the sale of the glasses and a separate charge for the sale of the services, and during March 1942 he customarily made separate charges, then the charge for the services is not subject to the General Maximum Price Regulation. The sale of the glasses, however, is subject to the General Maximum Price Regulation.

(*c*) If the seller makes a separate charge for the sale of the glasses and a separate charge for the sale of the services, but in March 1942 he did not customarily make separate charges, and made a single charge for the services and the glasses, then the sum of the charge for the examination and refraction of eyes plus the charge for the sale of the glasses is subject to the General Maximum Price Regulation and shall not exceed the highest charge made in March 1942 for the same combination of services and glasses. In order to maintain the correct maximum prices on the sale of the eye glasses, the sale of the glasses and the sale of the services shall be treated as a joint sale of the glasses and the services and are subject to the General Maximum Price Regulation.

These rules are embodied in Amendment No. 110 to Supplementary Regulation No. 14 of the General Maximum Price Regulation, which is effective February 19, 1943.

In view of these rules, OPA stated that a finding on the question of whether these services are professional as the term is used in section 302 (c) of the Emergency Price Control Act is unnecessary.

MOBILE HOSPITAL UNIT CITED

Adm. Chester W. Nimitz, Commander in Chief of the U. S. Pacific Fleet, has awarded a citation for distinguished service at the time of the attack on Pearl Harbor, Dec. 7, 1941, to Mobile Hospital Unit No. 2, the commanding officer of which when the raid occurred was Capt. John H. Chambers, M. C., whose home is in Philadelphia, and the executive officer Capt. John M. McCants, M. C., Fernandina, Fla. This mobile hospital unit (No. 2) had been shipped to Hawaii shortly before the Japanese attack on Pearl Harbor and, although construction of the unit had not been completed, its staff promptly undertook the care of those wounded in the raid. Operating skilfully and otherwise working for many hours, the doctors, nurses and hospital corpsmen attached to the Mobile Hospital Unit No. 2 rendered full medical care to the casualties.

ARMY-NAVY PRODUCTION AWARDS

Merck & Company, Inc., manufacturing chemists at Rahway, N. J., were awarded the Army-Navy Production Award, February 9, comprising a flag to be flown above the plant and a lapel pin symbolic of distinguished service to America, for every employee in the plant. Among those present at the ceremonies were the Hon. Charles Edison, governor of New Jersey, the Hon. David Armstrong, mayor of Rahway, Lowell Thomas as master of ceremonies, Major Gen. James C. Magee, Surgeon General, U. S. Army, Rear Admiral Luther Sheldon Jr., U. S. Navy, George W. Merck, president of the company, and George E. Lennox, president of the employees' organization. The printed program also contained a list of hundreds of Merck

employees who are now serving in the armed forces of the United States and the names of two who have been killed in action.

The employees of Burroughs Wellcome & Co., manufacturing chemists in Tuckahoe, N. Y., have been presented with the Army-Navy E Award. This worldwide organization produces immense quantities of medicinal preparations and first aid equipment for use of the allies.

The employees of the General Electric X-Ray Corporation were presented with the Army-Navy E Production Award February 16 at ceremonies held at the Crane Technical High School, 2245 West Jackson Boulevard, Chicago.

LEND-LEASE AID FOR FRENCH NORTH AFRICA

President Roosevelt on Nov. 13, 1942, directed that lend-lease aid be extended to people of French North Africa and the first step was the purchase of about $5,000,000 worth of civilian goods for North Africa. Many times that amount will be procured in coming months to be sent as shipping space becomes available. Among the items to be purchased under this program for North Africa are medical and hospital supplies; sugar, powdered and evaporated milk, and cheese; cotton textiles; ready made new and used clothing and shoes; copper sulfate to increase the production of vegetables and fruits for consumption by American troops as well as the inhabitants; coal for transportation, and kerosene for lighting. It has since been announced that Ethiopia also will be included in the lend-lease program.

Back of the lend-lease program is the idea of pooling the resources of the United Nations. South and West Africa are doing much to supply fruits and vegetables to American soldiers in those areas. This system of mutual aid means the building up of a modern transportation system which should be of lasting benefit to the peoples of the "Dark Continent."

AMERICAN-RUSSIAN COMMITTEE

Dr. Michael Michailovsky, treasurer of the American-Russian Committee for Medical Aid to the U. S. S. R., Inc., 55 West 42d Street, New York City, has submitted a financial report of the committee for the period from Aug. 18, 1941 to Jan. 8, 1943, which shows total cash receipts of $185,091.33 and total disbursements of $179,619.26, leaving cash in the bank on January 8 of $5,472.07. Of the total disbursements, $164,075 was turned over to Russian War Relief, Inc., for purchase and shipment to the U. S. S. R. of medical supplies and surgical instruments. In addition there was $12,496.47 of miscellaneous receipts, making the grand total $197,587.80. Of the total disbursements by the committee less than 3 per cent, or $5,750.43, was expended for administrative purposes. The president of the American-Russian Committee for Medical Aid to U. S. S. R., Inc., is Prince Vladimir V. Koudasheff and the secretary is Margarita Konenkova.

PSYCHIATRIST AT WAAC CENTER

Dr. Nita M. Arnold, former Chicago psychiatrist, is a contract surgeon with the rank of first lieutenant at the First WAAC Training Center, Fort Des Moines, Iowa. She is under contract with the Surgeon General of the Army. Dr. Arnold was born in Buenos Aires, Argentina, in 1898 and graduated at the Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, in 1930.

MEDICAL MEETING AT TRUAX FIELD

The staff of the Station Hospital at Truax Field, Madison, Wis., held a meeting on February 9 to which members of the Dane County Medical Society and the staff of the Wisconsin General Hospital were invited. The scientific program presented was as follows:

Major Dorrin F. Rudnick, Control of Venereal Disease in the Army.
Major Herbert D. Glick, Physical Requirements of the Flier.
Major John Chornyak, Psychiatric Problems Seen in the Army.
Major Charles S. Higley, Primary Atypical Pneumonia in the Army.
Major Bernard B. Larsen, Common Surgical Conditions Seen in the Army.

LIEUT. RUTH STRAUB AWARDED LEGION OF MERIT

Lieut. Ruth M. Straub of the Army Nurse Corps left her home in Greendale, Wis., in 1939 to be commissioned at Fort Sheridan, Ill., and almost immediately was sent to Manila. On Dec. 26, 1941 Lieutenant Straub was sent along with hundreds of patients in a boat to Corregidor; in February she was ordered to Bataan to work in a field hospital in the jungle, and which all nurses were ordered to evacuate in April. Their small boat made the trip to Corregidor just ahead of the Japanese in May. Lieutenant Straub with eleven other army nurses and one navy nurse then boarded a submarine and were returned to the United States by way of Australia. Lieutenant Straub has now been assigned to the Marana Basic Flying School near Tucson, Ariz., after having been awarded the Legion of Merit at Washington, D. C.

PUBLIC HEALTH UNDER HITLER

According to Transocean of Dec. 14, 1942 an announcement has been made by well informed scientific quarters in Berlin that the new German methods of combating typhus fever have proved so successful that the mortality rate has now been reduced to about 1 per cent.

New details of the German measures to combat typhus fever were announced at the opening of the great Typhus Research Institute of the German supreme command in Cracow, which has succeeded in producing bacteria in time to be used for prophylactic vaccination. These bacteria, which are kept alive in cans, are now being mass produced by a new technical process and dispatched to the German and allied troops fighting in the East. Hospitals and doctors have thus become entirely independent of fresh bacteria, as they can now use the canned bacteria.

A new method of diagnosing typhus fever has also been worked out. While it used to be necessary to take a sample of blood from the arm of a suspected patient, it is now only necessary to take a pinprick drop of blood from the lobe of the ear. The particular advantage of the new method is that it can be employed rapidly and by any untrained person or by the patient himself.

DNB of Dec. 9, 1942 states that on all fronts in the occupied territories and in the homeland well known doctors of all branches of medicine are assisting the medical officers serving with the forces and in the military hospitals in an advisory capacity. They guarantee that diagnosis and treatment for the German soldier always conform to the most up to date standards of medical knowledge and research. To discharge their duties properly, these consultant physicians must have opportunities to exchange their experiences gathered under wartime conditions. For this purpose a large number of consultant physicians of all branches of medicine and from all theaters of war recently met at a conference at the Academy for Military Medicine in Berlin. The meeting was called by General Oberstabsarzt Prof. Dr. Handleser, the head of the medical services of the armed forces. It was the first conference at which all the three services were represented, as well as the Waffen-SS, the police and the organizations attached to the armed forces such as the Reich Labor Service and the Organization Todt. Scientists of repute from all these formations took part in the meeting. Among the people who followed the lectures and discussion with interest were the fuehrer's general commissioner for health and medical services, Obersarzt Prof. Dr. Brandt, Secretary of State Dr. Conti and the medical inspectors of the three services, the Waffen-SS, the police and the organizations attached to the forces. All possible problems of medical care for the soldiers were thoroughly discussed during the conference, and every possible attention was paid to the problems of the new winter campaign. Just as much care was devoted to prophylactic measures and to the preservation of health as to the treatment of injuries which cannot always be avoided. New knowledge was made available to the medical officers with the troops at the front and the specialists in the military hospitals, so as to enable them to discharge their tasks as comrades of the fighting German soldier. The conference confirmed the feeling of certainty of success and of the victory of the German spirit, which by its discoveries and achievements is making constant progress possible in the art of medicine too.

ORGANIZATION SECTION

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—S. 180 has been reported to the Senate with recommendation that it pass, a bill to provide vocational rehabilitation education, training and other services to persons disabled while members of the armed forces, or disabled in war industries or otherwise and to render such persons fit for service in war industries, agriculture or other useful civilian industry. H. R. 801 has been favorably reported to the House, a bill to provide for the rehabilitation of disabled veterans of the present war.

Bills Introduced.—S. 607, introduced by Senator Kilgore, West Virginia, for himself and Senator Pepper, Florida; Senator Murray, Montana; Senator Ball, Minnesota; Senator Capper, Kansas; Senator Green, Rhode Island; Senator Johnson, Colorado; Senator LaFollette, Wisconsin, and Senator Thomas, Utah, proposes to establish an Office of War Mobilization to inventory and mobilize all the economic resources of the United States, including manpower, facilities, materials, technical and scientific knowledge, and natural resources for maximum use in the provision of military and essential civilian needs. An Office of Scientific and Technical Mobilization would be created to effect the full and immediate mobilization of scientific knowledge, technics and personnel, for the prosecution of war and for making adjustments necessitated by war conditions. S. 692, introduced by Senator Downey, California, provides compensation for personnel sustaining disease or injury while performing civilian defense duties. S. 699, introduced by Senator Bilbo, Mississippi, provides pensions to peacetime veterans of the Regular Army, Navy, Marine Corps and Coast Guard suffering from arrested tuberculosis contracted while in service. S. 702, introduced by Senator Kilgore, West Virginia, provides for the mobilization of the scientific and technical resources of the nation, establishing an Office of Scientific and Technical Mobilization. As used in the bill the term "scientific and technical personnel" means all persons, except physicians and dentists, who have completed any course of study in any college or university in any branch of science or its practical application or who have had not less than an aggregate of six months' training or employment in any scientific or technical vocation. S. 720, introduced by Senator Johnson, Colorado, and H. R. 1857, introduced by Representative Sparkman, Alabama, provide that during the present war and six months thereafter there shall be included in the Medical Departments of the Army and Navy such licensed female physicians and surgeons as the Secretary of War and the Secretary of the Navy may consider necessary. Those appointed will be commissioned, the bills propose, in the Army of the United States or the Naval Reserve and will receive the same pay and allowances and be entitled to the same rights, privileges and benefits as members of the Officers' Reserve Corps of the Army and the Naval Reserve of the Navy with the same grade and length of service. Female physicians and surgeons so appointed may be assigned only to duty in hospitals or other stations where female nurses are employed. H. J. Res. 53, introduced by Representative Burdick, North Dakota, proposes that a major joint committee of the Senate and House be set up to take over the whole problem of handling proposed social security legislation. H. R. 1796, introduced by Representative Cunningham, Iowa, provides that nominal income from personal services may be disregarded in computing payments to be made as old age assistance and aid to the blind under the Social Security Act. H. R. 1798, introduced by Representative Johnson, Indiana, provides protection against total permanent disability for persons granted national service life insurance. H. R. 1811, introduced by Representative Maas, Minnesota, proposes an appropriation of $2,000,000 to expand facilities for the hospitalization of dependents of personnel of the Navy and Marine Corps. The hospitalization of dependents of naval personnel at any naval hospital, the bill provides, will be on a per diem basis and all sums received in payment of such hospital charges will be deposited to the credit of the appropriation or fund for the maintenance and operation of naval hospitals. H. R. 1825, introduced, by request, by Representative Lesinski, Michigan, provides that all monetary benefits granted to veterans of World War I, and to their widows and dependents, be extended to the veterans of the present war, their widows and dependents. H. R. 1829, introduced, by request, by Representative Lesinski, Michigan, provides that the Administrator of Veterans' Affairs, within the limits of Veterans' Administration facilities, will be authorized to furnish necessary dental care and treatment to veterans of the present war who are not dishonorably discharged and who are not entitled to similar benefits under any law or veterans' regulation at the present time.

STATE MEDICAL LEGISLATION

Arizona

Bills Introduced.—H. 115 proposes the creation of a board of examiners for manual therapy, defined as a system of treatment wherein the muscles, joints, ligaments or tissues of the human body are moved or exercised by forces applied by the manipulator, assisted or supplemented by voluntary movements, by suggestion and advice, or by such mechanical, thermal, or electrical devices as may be required to facilitate normal movement or function of the joints, ligaments and tissues of the person manipulated. H. 146 proposes to require every physician attending a pregnant woman to take a sample of her blood not less than ten days after the first visit and to submit such sample to an approved laboratory for a standard test for syphilis.

Arkansas

Bills Introduced.—H. 194 proposes to make it unlawful for any one to use dynamite, nitroglycerin or other form of explosive within 2 miles of any private or public hospital. H. 271 proposes to require every person applying for a marriage license to present a certificate signed by a qualified physician licensed to practice medicine and surgery certifying that the applicant is not infected with syphilis in a communicable stage.

California

Bills Introduced.—A. 1553 proposes to require all food handlers and domestic servants to obtain a certificate from a licensed physician and surgeon showing freedom from communicable diseases and to renew such certificate every three months. A. 1608, to amend the revenue code, proposes to exempt from the sales tax the sale of medicines, tonics and preparations sold as dietary supplements or adjuncts. A. 1659, to amend the business and professions code, proposes to require vendors of prophylactics to renew their licenses annually. A. 1729, to amend the penal code, proposes to require any person accused of intoxication or a crime involving intoxication to be examined by a licensed physician immediately on his being arrested, the duty of the physician being to determine whether or not the accused was in fact intoxicated. A. 1782 proposes the enactment of a new uniform vital statistics act. A. 1830, to amend the prenatal examination law, proposes to authorize chiropractors to obtain the required blood specimen. A. 1831, to amend the labor code, proposes to authorize injured employees to receive the services of a chiropractor at the expense of the employer. A. 1832, to amend the business and professions code, proposes to authorize schools teaching any of the healing arts to establish graduate courses of study in homeopathy, herbology, vitamin therapy, proprietary medicine

and drugs, minor surgery, materia medica, physical therapy, anesthesiology, obstetrics and certain other subjects. Graduates would be granted a degree of "physician" and would be entitled to practice the subjects taught in the graduate courses. A. 1833, to amend the business and professions code, proposes to authorize any accredited school of medicine, surgery, osteopathy, chiropractic and any hospital to establish courses of training in nursing, the graduates of such courses to be known as graduate war nurses. A. 1841, to amend the premarital examination law, proposes to authorize chiropractors to make the required certificate of exemption from venereal disease.

Georgia

Bills Introduced.—H. 135 proposes to require each person applying for a marriage license to furnish a certificate signed by a qualified physician licensed to practice medicine and surgery in any state or United States territory certifying that the applicant is not infected with syphilis in a communicable stage. H. 136 proposes to require all licensed physicians attending a pregnant woman to take a sample of blood within thirty days of the first examination and to submit such sample to an approved laboratory for a serologic test for syphilis.

Idaho

Bills Enacted.—H. 24 has become chapter 26 of the Laws of 1943. This law requires every licensed physician attending a pregnant woman to take a sample of her blood at the time of the first examination and to submit such sample to a laboratory for a standard serologic test for syphilis. H. 43 has become chapter 42 of the Laws of 1943. It provides that each applicant for a marriage license must produce a certificate signed by a licensed physician certifying that the applicant has been thoroughly examined and is not infected with syphilis in a communicable stage. The physician making the examination may not charge more than $2. H. 111 has become chapter 52 of the Laws of 1943. It exempts from the payment of any professional license or renewal fee all persons now holding such a license who are serving in the armed forces of the United States during the term of their military service.

Indiana

Bills Introduced.—H. 73 proposes to authorize the suspension of a driver's license on conviction of operating an automobile while under the influence of intoxicating liquor or narcotic drugs. H. 294 proposes to authorize the divison of public assistance to establish and maintain clinics for the care and treatment of eyes, under the supervision of an ophthalmologist or eye specialist who shall be a doctor of medicine licensed to practice medicine in the state. H. 462 proposes, in effect, that physicians' records shall be competent evidence in court if the custodian testifies to the identity and mode of preparation of the record and if the records were made in the regular course of business.

Iowa

Bills Introduced.—S. 68, to amend the divorce law, proposes to authorize the granting of a divorce when one of the parties to a marriage has been totally insane for a period of five years and there is no reasonable hope of recovery. S. 219 proposes that when a person has been arrested for operating a motor vehicle while intoxicated a sample of such person's blood or urine may, with the consent of the person so charged, be taken by a duly licensed physician and subjected to chemical analysis, the results of which analysis shall be receivable in evidence. The fact of refusal by a person to permit a sample of blood or urine to be taken will likewise be admissible in evidence.

Kansas

Bill Introduced.—H. 293, to amend the osteopathic practice act, proposes to extend the scope of osteopathic practice so as to authorize licentiates to practice as physicians and surgeons of the osteopathic school of medicine, which shall include the right to practice operative surgery with instruments, and obstetrics, to prescribe and administer narcotics, analgesics, anodynes, anesthetics, antiseptics, antidotes, serums, vaccines and biologicals, and to have the same rights as practitioners of other schools of the healing art with respect to rendering services under the provisions of laws relating to health insurance, workmen's compensation, control of infectious diseases and care of the indigent.

Michigan

Bills Introduced.—S. 113, to amend the medical practice act, proposes to authorize the Michigan state board of registration in medicine to suspend in whole or in part the educational requirements prescribed by the act at any time during the state of war now existing between the United States and various other nations. H. 166 proposes to authorize the boards of supervisors of certain counties throughout the state to provide group life, health and accident and/or hospitalization insurance for the employees of such counties.

Montana

Bills Introduced.—S. 73, to amend the chiropractic law, proposes to extend the scope of chiropractic practice to include physiotherapy, electrotherapy, hydrotherapy, proctology and minor surgery and to require chiropractors to be examined in such subjects. H. 118, to amend the medical practice act, proposes, among other things, to authorize the board of medical examiners to prescribe and enforce reciprocity requirements current with changes in standards of the practice of medicine and surgery.

Bill Passed.—S. 97 passed the senate on February 11. It proposes to relieve physicians in the military service of the United States from paying annual license fees during the period of such service.

New York

Bill Introduced.—S. 528, to amend the public health law, proposes to require domestic servants to furnish a certificate from a duly licensed and registered physician certifying freedom from tuberculosis and from any venereal disease.

Ohio

Bills Introduced.—H. 54 proposes to exempt from the sales tax the sales of prescription medicines. H. 78, to amend the medical practice act, proposes that administering to human ills through prayer or spiritual means alone in accordance with the tenets or creed of any religious denomination for a fee or compensation shall not be regarded as practicing medicine. H. 112, to amend the osteopathic law, proposes the creation of a state osteopathic examining board to take the place of the existing osteopathic examining committee. H. 113, to amend the law relating to municipal hospitals, proposes that in the management and control of municipal hospitals there shall be no discrimination against any physician, or the patient of any physician, who holds a certificate to practice in Ohio, whether it is medicine or surgery, or osteopathy or chiropractic. H. 167, to amend the premarital examination law, proposes that when one of the applicants is in the military service of the United States his physical certificate may be signed by a commissioned medical officer of the military service.

Oklahoma

Bills Introduced.—S. 98 proposes to authorize a physician legally qualified to practice in the state of Oklahoma to perform a postmortem cesarean section when the physician has reason to believe that the child is viable in the mother. In the performance of such operation, the physician shall not be liable either civilly or criminally even though the operation is performed without the consent or even against the protest of those in whom the law has recognized a legal right of possession of the body of the deceased, provided only that the operation is performed in good faith and with due skill and without unnecessary injury or mutilation. H. 37 proposes to authorize the state and local health officers to examine arrested persons to determine whether or not they are infected with a venereal disease and, if found infected, to quarantine such persons for the purpose of treatment.

Pennsylvania

Bills Introduced.—H. 236 proposes that for the duration of the war a minimum of nine months rather than one year internship shall constitute the necessary legal training to qualify for admission to examination for a license to practice medicine

and surgery in Pennsylvania. H. 235 proposes to authorize the state board of medical education and licensure to issue temporary certificates to physicians licensed in other states to authorize them to practice medicine and surgery in Pennsylvania for the duration of the present war and six months thereafter.

South Carolina

Bill Enacted.—H. 33 has become Governor's Act No. 11 of the Laws of 1943. This law eliminates from the medical practice act the requirement that no two of the required four full courses of lectures may be given in the same year. The purpose of this law is to enable graduates of accelerated medical courses to obtain licensure in South Carolina.

South Dakota

Bills Introduced.—S. 129, to amend the basic science act, proposes to exempt from the provisions of the act any person acting as an assistant or under the supervision and direction of a person holding a basic science certificate. S. 186 proposes an appropriation for the purchase and installation of hydrotherapy equipment in the state hospital for the insane. H. 206 proposes to authorize the sterilization of inmates of the state hospital on recommendation of the superintendent when it is shown that the inmate suffers from certain mental diseases, perversion or diseases of a syphilitic nature and that the person is capable of procreation. Provision is also made for the voluntary sterilization of any inmate. H. 207 proposes to authorize the granting of the writ of habeas corpus to persons having a "psychopathic personality," defined as the existence of such conditions of emotional instability and impulsiveness of behavior and lack of customary standards of good judgment, or failure to appreciate the consequences of his acts or a combination of any such conditions, as to render such person irresponsible for his conduct with respect to sexual matters or in respect to matters relating to acts and conduct of a criminal nature and thereby dangerous to other persons.

Tennessee

Bill Introduced.—H. 198 proposes to provide for the sterilization of inmates of certain state institutions when it has been determined that procreation by such inmate is inadvisable. The determination must be unanimously made by a physician, a psychologist, a sociologist and an officer of the institution in which the inmate is confined.

Bills Enacted.—S. 77 has become chapter 44 of Public Acts of 1943. It provides that all persons employed as food handlers must procure a health certificate, including a Wassermann test, signed by a physician licensed to practice in the state of Tennessee, which certificate must be renewed annually. S. 160 has become chapter 73 of Public Acts of 1943. It provides that every physician who makes a diagnosis of or treats or prescribes for a case of venereal disease, including syphilis, gonorrhea and chancroid, shall report such case immediately to the full time municipal health officer. S. 300 has become chapter 26, Public Acts of 1943. It authorizes the coroner, when requested so to do by the district attorney, to summon a physician or surgeon to examine a person or to perform an autopsy thereon and to give his professional opinion as to the cause of death. The fee of such physician shall be limited to $25. H. 76 has become chapter 92 of the Public Acts of 1943. It provides for the creation of a board of examiners in the basic sciences of anatomy, physiology, chemistry, bacteriology and pathology. Exempted from the operation of the act would be osteopaths, chiropractors, if they do not possess, prescribe or administer drugs, as well as dentists, naturopaths, nurses, midwives, optometrists, chiropodists, barbers, cosmeticians, or Christian scientists practicing within the limits of their respective callings.

Washington

Bills Introduced.—S. 167, to amend the basic science act, proposes that the existing examining committee be dissolved and that a new committee be created to be composed of one member from each school of practice licensed in the state of Washington. Under the existing law the members of the examining committee are chosen from the faculty of the University of Washington and Washington State College. H. 238 proposes to exempt chiropractors from the basic science law.

West Virginia

Bill Introduced.—H. 230 proposes, among other things, to require every physician who examines or treats a person having syphilis, gonorrhea or chancroid to instruct such person in measures for preventing the spread of the disease and to inform such person of the necessity of taking treatment until cured. If the person fails to report for treatment, the physician must make a report of such fact to the local health officer.

WOMAN'S AUXILIARY

Florida

The Woman's Auxiliary to the Duval County Medical Society voted a contribution to the WPA Nursery, on recommendation of the philanthropic chairman, Mrs. John H. Mitchell. Plans were made for a supper to be given for service men at the WJAX recreation center. Officers of the auxiliary are: Mrs. J. W. Hayes president, Mrs. E. W. Veal vice president, Mrs. L. M. Wachtel secretary and Mrs. G. H. Ira treasurer.

Georgia

The Woman's Auxiliary to the Fifth District Medical Society held its semiannual meeting at the Academy of Medicine on West Peachtree Street in Atlanta. Mrs. J. Harry Rogers, manager, presided. Mrs. J. Lon King of Macon, president of the Woman's Auxiliary to the Medical Association of Georgia, was the honor guest of the evening. A program was presented by the medical staff of the Lawson General Hospital.

Indiana

The Allen County medical auxiliary had Dr. L. Potter Harshman as its speaker at the Lutheran Hospital. His subject was "Psychiatry in the Present Crisis." Mrs. Elmer C. Singer presented recent legislation.

Since January the Woman's Auxiliary to the Orange County Medical Society has had five meetings, supper meetings at the homes of members, at which problems concerning the county medical society were discussed at the table. Members have done more than their share of the war program activities. One of its members taught a Home Nursing class. The main project for the year was the promotion of a wider circulation of *"Hygeia."* A survey of all doctors' and dentists' offices, schools, libraries and beauty parlors was made. Fifteen subscriptions were obtained.

Minnesota

The Hennepin County auxiliary has two new projects under way. One is the Red Cross dressing group, which, although organized last year, did not function until this year owing to lack of supplies. Mrs. J. P. Hiebert is chairman with Mrs. J. M. Hall co-chairman. The second activity is the staffing of a War Saving Stamp booth in the Medical Arts lobby with Mrs. Hugh Tunstead in charge. Both projects are carried on with the cooperation of the dental auxiliary.

Utah

In December a luncheon was held at the home of Mrs. Silas S. Smith, president of the auxiliary to the Utah State Medical Association, for officers of the state organization. The guest was Mrs. Frank N. Haggard of San Antonio, Texas, President of the Woman's Auxiliary to the American Medical Association. Her message was for the members to give their time and effort in self education to help in the war effort. Fifty members were present.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Dr. King Observes Ninetieth Birthday.—Dr. John C. King, Pasadena, formerly president of the California Medical Association, observed his ninetieth birthday, February 9. Dr. King, who has been in retirement since 1923, graduated at the University of Nashville Medical Department, Nashville, Tenn., in 1874. He had been president of the high school board in Banning for twenty years and was one of the founders of the San Bernardino County Medical Society, serving as its president and earlier of the Riverside County Medical Society and the state board of medical examiners.

New Virus Diagnostic Unit.—The division of laboratories of the state department of public health recently established a virus diagnostic unit to render assistance to physicians of the state in the diagnosis of certain neurotropic virus diseases, including at present western equine encephalitis and St. Louis encephalitis, and probably later lymphocytic choriomeningitis. All health officers, physicians and hospitals wishing assistance or confirmation in the diagnosis of these diseases may send specimens to and obtain containers from the State Department of Public Health, Division of Laboratories, Virus Unit, 1390 University Avenue, Berkeley. A supply of containers will be available at city health departments soon.

Assistant Medical Director and Superintendent Needed.—The California State Personnel Board on February 9 announced examinations to be held soon for the positions of assistant medical director and superintendent at a mental hospital. The position of assistant medical director has a salary range from $260 to $340 a month plus maintenance for self and family. Entrance requirements include possession of a license to practice as a physician and surgeon, graduation from a medical school and three years of medical practice, two years of which shall have been in a mental hospital. The position of superintendent of the mental hospital has a salary range of $360 to $440 plus complete maintenance for self and family. Qualifications must include possession of a license to practice as a physician and surgeon, graduation from medical school and five years of medical experience in a mental hospital. Candidates who are successful in the examination must secure a license to practice as a physician and surgeon in California before they can be considered eligible for appointment except that any such candidate who has applied for a California license may be appointed for a period of not more than one year. Official application forms may be obtained from the offices of the state personnel board, 1015 L Street, Sacramento. The final date for filing applications is March 10.

Langley Porter Clinic Dedicated.—The Langley Porter Clinic at the University of California Medical School, San Francisco, was opened with appropriate ceremonies on February 13. The outpatient department was named in honor of the late Dr. Aaron J. Rosanoff, who at the time of his recent death was director of the state department of institutions and was to a large measure responsible for the building of the Langley Porter Clinic. Mrs. Dora Shaw Heffner, Los Angeles, director of the state department of institutions, presided at the morning session. Among the speakers were:

Dr. Walter L. Treadway, Los Angeles, Memorial to Dr. Aaron J. Rosanoff.
Dr. Glenn E. Myers, Los Angeles, Dr. Aaron J. Rosanoff.
Dr. Fred O. Butler, Eldridge, The Langley Porter Clinic and Its Relationship to the State Department of Institutions.
Dr. Thomas W. Hagerty, Camarillo, The Work of the California State Hospitals in the Prevention and Treatment of Mental Disorders.
Dr. Langley Porter, San Francisco, Potential Contributions of a Psychiatric Hospital in a Total University Setting.
Harry M. Cassidy, Berkeley, Psychiatry and Social Work.
Mrs. Jean W. MacFarlane, Berkeley, Psychiatry and Clinic Psychology.
Miss Margaret A. Tracy, Berkeley, Psychiatry and Nursing.

Robert G. Sproul, LL.D., president of the University of California, Berkeley, presided at the evening session in Toland Hall at the University of California Hospital, at which speakers, all of San Francisco, were:

Dr. Francis S. Smyth, Psychiatry and Pediatrics.
Dr. William J. Kerr, Psychiatry and General Medicine.
Dr. Howard C. Naffziger, Neurological Surgery and Its Relations.
Dr. Karl M. Bowman, Psychiatry and the Langley Porter Clinic.

The new clinic is a neuropsychiatric unit of the state department of institutions, named in honor of Dr. Langley Porter, dean emeritus and professor of medicine and lecturer in medical history and bibliography emeritus of the medical school.

DELAWARE

Society News.—Dr. Harry E. Bacon, Philadelphia, discussed the diagnosis and treatment of common rectal diseases before the Newcastle County Medical Society in Wilmington, January 19. Dr. Edgar R. Miller, Wilmington, addressed the society recently on "The Uses and Limitations of the Electrocardiogram." Dr. John F. Hynes, Wilmington, discussed "Carcinoma of the Cervix" before the society on February 16.

Deputy State Health Officer Needed.—The Merit System for Personnel Administration in Delaware is accepting applications for the position of deputy state health officer in the state board of health. The salary range for the position is $3,600 to $4,200 and applications will be accepted until further notice. The applicant must show graduation from an approved medical school, internship of one year in a hospital approved for internship by the American Medical Association, license to practice medicine and be qualified for licensure in Delaware. The applicant must have had one year in a school of public health of recognized standing prior to or within a period of three years from the date of employment, and at least two years full time paid professional experience in the field of public health. Preference will be given to persons having a degree in public health. The applicant must be not more than 35 years of age when beginning public health work. Additional information may be obtained from Merit System of Personnel Administration, 512 Continental American Life Building, Wilmington.

ILLINOIS

Social Hygiene Day.—On February 3 the state department of health and the state department of public welfare jointly sponsored a statewide observance of social hygiene day. This is the first year the welfare department took part in this observance. On February 3 the first of six regional conferences on venereal disease control for public health nurses was held at Joliet. Others were planned for Dixon, Springfield, Champaign, Herrin and Centralia.

Test Case Ruling Affects Alien Applicants for Examination in Medicine.—In a test case January 22, Judge John Prystalski, in circuit court, upheld the right of the state department of registration and education to forbid the taking of examinations by persons from European schools, newspapers reported. The decision in effect barred more than 150 graduates of European medical schools from practicing medicine who had applied for permission to take the state examinations in April. The test case covered the ruling of the state board of examination, adopted June 2, 1942, which prohibited graduates of medical colleges in continental Europe and graduates of the extramural colleges of Scotland and Ireland who finished after July 1, 1936. Switzerland graduates were excepted. This rule is to be in force until a true evaluation of the colleges referred to may be obtained, at which time such nonaccredited foreign colleges will be required to prove to the department that their courses and equipment are in every way equal to American medical colleges accredited by the department of registration and education. In dismissing the suit, Judge Prystalski is reported to have said that he had no authority to interfere with administrative regulations of the department.

Chicago

Ludvig Hektoen Lecture.—Dr. Lloyd F. Craver, New York, will deliver the nineteenth Ludvig Hektoen Lecture of the Frank Billings Foundation on March 26 at the Palmer House under the auspices of the Institute of Medicine of Chicago. Dr. Craver will discuss "The Diagnostic Problems of Early Cancer."

The Capps Prize.—The Institute of Medicine of Chicago announces that the Joseph A. Capps Prize for Medical Research for 1942 has been awarded to Dr. Mary E. Martin, who graduated at Northwestern University Medical School in 1941, for her investigation on "Distribution of Nerves in the Adult Human Myometrium." The prize is awarded annually to a young graduate of a Chicago medical school for the most meritorious investigation in medicine or in the specialties of medicine.

Course in Ear, Nose and Throat.—A refresher course in laryngology, rhinology and otology will be held at the University of Illinois College of Medicine, March 22-27. To meet the needs of ear, nose and throat specialists who, under existing conditions, are able to devote only a brief period to postgraduate review study, this didactic and clinical course has been arranged. Registration is limited. The fee for the complete course is $50. Letters requesting application for registration should include school and year of graduation, also details concerning specialty training and experience. Address Department of Oto-Laryngology, University of Illinois College of Medicine, 1853 West Polk Street.

INDIANA

Society Arranges Night Service for Public.—On January 10 a plan of answering emergency night calls was begun by the Indianapolis Medical Society, according to the bulletin of the society. The medical society has an unlisted telephone number (Ri. 4796) which is answered by a member of the society who has volunteered for this service. The members of the society may refer calls to this number when they do not wish to make them. This service is in operation from 8 p. m. until 7 a. m. daily. The calls are made by house officers of the Indianapolis City Hospital. The fee is $5 for calls inside the city and 25 cents a mile additional charge for calls outside the city. The doctor who answers the telephone asks the person calling who referred them to this number. If the call is received before 11 p. m. the referring doctor is called to verify the fact that he does not wish to make this call. If the call is received after 11 o'clock the doctor is not called until the next morning. If the person calling is unable to pay, he is referred to the Indianapolis City Hospital. Obstetric calls are handled by the Outdoor Obstetrical Service of the city hospital. If in the opinion of the visiting physician the patient needs immediate hospitalization, the patient is sent to a private hospital and it is then the duty of the hospital to call the proper physician from its staff. Patients are always told that this is an emergency service and that no return calls will be made. They are referred to their family doctor or, if they do not have a family doctor, they are given a list of the members of the society who are practicing in their vicinity.

LOUISIANA

Changes in Health Officers.—Dr. Abraham Oppenheim, Arcadia, director of the Bienville Parish Health Unit, has been appointed in charge of the units in Vermillion and New Iberia parishes.——Dr. Roy A. Kelly, New Roads, director of the St. Charles Parish Health Unit, was recently assigned in charge of the Jefferson Davis Health Unit.

Graduate Medical Assembly.—The seventh annual New Orleans Graduate Medical Assembly will be held at the Roosevent Hotel, New Orleans, March 15-18. The program will include lectures, clinics, symposiums, clinicopathologic conferences, scientific and technical exhibits, medical motion pictures and round table luncheons. Among the speakers who will discuss one or more papers will be:

Dr. Tinsley R. Harrison, Winston-Salem, N. C.
Dr. Robert J. Crossen, St. Louis.
Dr. James G. Townsend, Bethesda, Md.
Sister Elizabeth Kenny, Minneapolis.
Lieut. Col. Edgar V. Allen, M. C., Army of the United States.
Dr. Louis Hamman, Baltimore.
Lieut. Col. Roy Glenwood Spurling, M. C., Army of the United States.
Dr. Ralph I. Lloyd, Brooklyn.
Dr. Nicholson J. Eastman, Baltimore.
Dr. Edwin W. Ryerson, Chicago.
Dr. John J. Shea, Memphis.
Dr. Howard T. Karsner, Cleveland.
Dr. Erling S. Platou, Minneapolis.
Dr. Fred J. Hodges, Ann Arbor, Mich.
Dr. Warren H. Cole, Chicago.
Major Rettig Arnold Griswold, M. C., Army of the United States.
Dr. Charles B. Huggins, Chicago.

MASSACHUSETTS

State Meeting to Be in Boston Instead of Springfield.—The Massachusetts Medical Society will hold its annual session at the Hotel Statler, Boston, May 25-26, instead of at the Hotel Kimball, Springfield, May 18-19.

Dr. Symonds to Give the Dunham Lectures.—Dr. Charles Putnam Symonds, Air Commodore in the Royal Air Force and consultant in neurology, will deliver three lectures at Harvard Medical School, Boston, under the Edward K. Dunham Lectureship for the Promotion of the Medical Sciences, on "The Human Response to Flying Stress." The separate lectures will be March 10, "The Two Sides of the Problem"; March 11, "The Foundation of Confidence," and March 12, "Air Crew Selection and Maintenance."

Dr. Landis Named as Professor of Physiology at Harvard.—Dr. Eugene Markley Landis, professor of internal medicine at the University of Virginia Department of Medicine, Charlottesville, has been appointed George Higginson professor of physiology at Harvard Medical School, Boston, filling the vacancy that occurred on the retirement of Dr. Walter B. Cannon, Cambridge. The appointment will be effective July 1. According to the *Harvard Medical Alumni Bulletin*, although Dr. Landis is an internist most of his researches have been essentially physiologic in nature or have concerned basic physiologic principles in medical conditions. In 1926 Dr. Landis graduated at the University of Pennsylvania School of Medicine, Philadelphia, where he was in 1931 associate in medicine and in 1934 assistant professor. He has been professor of medicine at the University of Virginia since 1939. In 1936 he received the John Phillips Memorial Medal of the American College of Physicians.

MICHIGAN

New District Health Unit.—Leelanau County has joined with the Grand Traverse county department of health to form a new district organization. Dr. Buell H. Van Leuven, Traverse City, will be in charge. The Grand Traverse unit has functioned since April 1939.

Koch Trial Opened.—The federal government's trial against Dr. William F. Koch and his brother Louis on charges of violating the Federal Food, Drug and Cosmetic Act opened in Detroit January 12. Dr. Koch has long been identified with an alleged cancer cure. The two Kochs are, respectively, president and secretary of the Koch Laboratories, Inc., Detroit, promoters of various products, including treatments sold for cancer and other conditions. The federal charge is that three preparations of the Koch Laboratories have been shipped from Detroit to other states with false and misleading labels which made representations that could not be justified by facts. The Detroit Sunday *Times*, January 10, reported that a federal trade commission action against the brothers is pending, awaiting the outcome of the Food, Drug and Cosmetic Act case. Dr. Koch first announced his so-called cancer cure in 1919, the year following his graduation at the Detroit College of Medicine. Later his claims extended to "cures" for allergies and infections. In 1933 he moved to Delray Beach, Fla., and operated a clinic there, while his brother Louis managed the laboratories in Detroit.

Annual Lecture Marks Dedication of Beaumont Room.—Col. Edgar Erskine Hume, M. C., U. S. Army, Washington, D. C., delivered the twenty-second annual Beaumont Lecture before the Wayne County Medical Society, Detroit, February 15, on "Contributions of U. S. Army Medical Officers to Science." The occasion marked the dedication of the Beaumont Room in the David Whitney House, the headquarters of the county medical society, the official ceremonies preceding the lecture, which was delivered at the Art Institute. A portrait of William Beaumont by Deane Keller of the Yale School of Fine Arts, New Haven, Conn., was unveiled at the Art Institute and subsequently placed in the Beaumont Room at the society headquarters. "Beaumont and St. Martin," one of the series of paintings executed by Dean Cornwell, New York, was displayed for the occasion. The Beaumont Room was set aside last year for memorabilia (THE JOURNAL, July 25, 1942, p. 1033). The present collection includes contemporary miniatures of Dr. and Mrs. Beaumont, made available by Mrs. May Beaumont Brotherton of Green Bay, Wis., and her sister, Mrs. Ruth B. Brown of Iron River and a number of rare medical books including a first edition of "Experiments and Observations on the Gastric Juice and the Physiology of Digestion."

NEW JERSEY

Honorary Degrees Conferred.—The New Jersey College of Pharmacy of Rutgers University awarded honorary degrees to the following at graduation exercises in the auditorium of the Mutual Benefit Life Insurance Company on January 6: Dr. Morris Fishbein, Chicago, Editor of THE JOURNAL, Dr. Thomas M. Pascall, Newark, chief surgeon of Public Service Corporation and medical consultant of Fidelity Union Trust Company, and Adolph F. Marquier, Newark pharmacist. George D. Beal, Ph.D., Pittsburgh, recipient of the Remington Medal in 1941 for the greatest contribution to pharmacy during the year, received the honorary degree of doctor of science.

Dr. Bingham Receives Award.—Dr. Arthur W. Bingham, East Orange chairman of the committee on maternal welfare of the Medical Society of New Jersey for twelve years, was presented with the fourth Dr. Edward J. Ill Award by the Academy of Medicine of Northern New Jersey. The award is a bronze plaque given to a physician by the academy "at such time as it deems it wise, who merits it for extraordinary service as a physician and a citizen." It was established by the academy to honor its first president, Dr. Edward J. Ill, who died last year. Dr. Bingham graduated at Columbia University College of Physicians and Surgeons, New York, in 1896.

"Sanitation Wardens" Organized.—A new volunteer civilian corps to be known as "Sanitation Wardens" was organized at a meeting of the health committee of the community war services division in Plainfield recently. Sanitation wardens, according to the sponsor of the plan, Mr. Andrew J. Krog, health officer of Plainfield, will be allocated to city districts according to the number of eating and drinking estab-

lishments within the confines of a district. They will be deputized to make inspections of establishments where food and drink are sold on the premises for consumption and possibly later for the investigation of "sanitation nuisances" generally. The wardens will not have the power to take official action but will report back to the health department, from whose office they will operate; they will in effect be junior assistants to paid health inspectors. A regular training course has been devised to include a series of lectures, demonstrations and movies and, as part of the training, volunteers will accompany regular health inspectors during their daily check-ups.

NEW YORK

Anatomist Dies.—Charles Howell Ward, Rochester, founder of the Charles H. Ward Anatomical Laboratory and pioneer commercial anatomist, died, January 18, aged 80. Mr. Ward was a member of the Rochester Dental Society and of the Seventh District group of the New York Dental Society.

Graduate Lecture.—Dr. Foster Kennedy, New York, will discuss "Nervous Conditions Associated with Warfare" in Ithaca before the Tompkins County Medical Society on March 16. The lecture is part of a postgraduate program sponsored by the state medical society and the state department of health.

Survey of Child Care Need.—Authorization has been given to one hundred and eight local war councils in the state to make an immediate canvass in their territories to find out the number of mothers having children under 16 who are engaged in work in war plants and the number of children affected. The work is being carried out at the request of Governor Thomas E. Dewey to lay the ground work for his plan to establish child care centers wherever necessary.

New York City

Dr. Hirsh Honored.—On January 28 a dinner was held at the Hotel Savoy-Plaza to honor Dr. A. Bern Hirsh on his retirement as managing editor of the *Journal of the Medical Society of the County of New York*. Dr. Charles Gordon Heyd was toastmaster. Other speakers included Dr. Edward C. Titus and Col. Samuel J. Kopetzky, M. C., U. S. Army, who paid tribute to Dr. Hirsh for establishing the *New York Medical Week* and his service to its successor the *Journal of the Medical Society of the County of New York*. In 1905 Dr. Hirsh founded the *Weekly Roster and Medical Digest*, now known as *Philadelphia Medicine*, and served as its editor until 1917.

Health Codes for Day Nurseries.—The city board of health has adopted a new health code for day nurseries which are caring for an increasing number of children as mothers enter industry. The new regulations includes an annual physical examination for each staff member, examination of each child when admitted and every six months thereafter, and provision for feeding the children every four hours according to a diet prepared by the health department. The food, milk and kitchen equipment of the nurseries will be strictly inspected. Minimum play, rest and sanitary space, depending on the registration, are prescribed. Each agency also must prove its financial competence to comply with the standards.

"Arts in Therapy."—The Museum of Modern Art opened an exhibition to the public on "The Arts in Therapy," February 3. The exhibition will later circulate through the country. Last fall the museum, in cooperation with Artists for Victory, held a competition in which artists and craftsmen all over the nation were asked to submit new designs and objects that might be utilized in art therapy. The twenty-three entries which received prizes of $500 are included in the display. James Thrall Soby, director of the museum's armed services program, said the "exhibition has been designed to encourage and broaden the use of the various arts and crafts in therapeutic work among disabled and convalescent members of the armed forces." The exhibition has been divided into two sections. The first section comprises objects and projects related to those crafts which have been found of therapeutic and recreational value to patients. In the second section is illustrated the use of drawing, painting and sculpture in therapy conducted from the psychiatric point of view as a means both of diagnosis and of cure. The first or occupational therapy section of the exhibition includes more than a hundred items in the various crafts, such as weaving, woodworking, paper construction, metal work, pottery, toys and similar objects that might be made by physically handicapped men.

Centennial of Holmes's Paper on Puerperal Fever.—The one hundredth anniversary of the publication by Oliver Wendell Holmes of his paper on "The Contagiousness of Puerperal Fever" was observed at the New York Academy of Medicine, February 19. "The Family Faces the Future" was the theme of the morning program, with the following speakers: Mr. Lawrence K. Frank, chairman of science, National Resources Planning Board; Dr. Abraham A. Brill; Stanley P. Davies, Ph.D., executive director, Community Service Society of New York, and Dr. Frank Fremont-Smith. The theme of the luncheon conference was "Maternity and the Changing Family Scene" with Louis I. Dublin, Ph.D., chief statistician and third vice president of the Metropolitan Life Insurance Company; Dr. Alan F. Guttmacher, Baltimore, and Miss Hazel Corbin, general director, Maternity Center Association, Inc. There was an afternoon symposium on "Meeting the Problems of Maternity Welfare and Child Health Along Many Fronts" by the following speakers:

Miss Alta E. Dines, Community Service Society of New York.
Miss Frances Taussig, Federation for the Support of Jewish Philanthropic Societies of New York City.
Mrs. Sidonie M. Gruenberg, Child Study Association of America, Inc.
Mr. D. Kenneth Rose, Planned Parenthood Federation of America, Inc.
Dr. Thomas W. Patrick Jr., New York Urban League, Inc.
Dr. Leona Baumgartner, New York City Department of Health.
Dr. Elizabeth M. Gardiner, Albany, New York State Department of Health.
Mrs. Shepard Krech, Maternity Center Association, Inc.
Dr. Herbert B. Wilcox, New York Academy of Medicine.

At the evening meeting Dr. Arthur Z. Chace, president of the academy, gave the address of welcome and Dr. Richard N. Pierson, chairman of the Holmes Centenary Committee, presided. Dr. Reginald Fitz, Boston, spoke on "My Doctor Holmes" and Dr. Benjamin P. Watson, director of the Sloane Hospital for Women, discussed "Oliver Wendell Holmes—A Century's Vindication of His Work on Puerperal Fever."

OHIO

New Heart Station.—The Max Stern Heart Station has been established in Cincinnati through a gift of Mrs. Martha S. Stern in memory of her husband. Approved by the Cincinnati Board of Health, the new station will be conducted under the supervision of a committee appointed by the Heart Council. Dr. Bernice L. G. Wedum, Cincinnati, on the staff of Children's Hospital, has been appointed clinician of the heart station.

Outbreak of Smallpox.—Six additional cases of smallpox reported to the Ohio State Department of Health for the week ended January 17 brought the total to 27 since the outbreak in December, according to the Columbus *Citizen*, January 17. Three of the new cases were reported from Holmes County, where an outbreak occurred in the Amish settlement. The outbreak in Ohio and the one in Pennsylvania (THE JOURNAL, January 2, page 61) were related when it was found that the wife of an Amish minister became ill with the disease following their return from a trip into Pennsylvania, Maryland and Delaware.

Personal.—Dr. Richard T. Morgan has been appointed coroner of Marion County to succeed his son, Dr. Richard L. Morgan, who has entered military service.——Lieut. Comdr. William McKinley Johnston, M. C., on leave from the U. S. Naval Reserve after serving at Guadalcanal, was guest of honor at a dinner in the Akron City Club, January 6.——Dr. Alexander S. McCormick, Akron, who recently retired as secretary of the Summit County Medical Society after serving the society in various capacities for twenty-eight years (THE JOURNAL, January 23), was presented with a wrist watch at the January meeting by Dr. James G. Kramer, Akron, the outgoing president.——Dr. Hugh J. Means, Columbus, has been promoted to professor of roentgenology in the department of surgery and full time director of the x-ray laboratory in the Starling-Loving University Hospital.

OKLAHOMA

Institutes in Wartime Industrial Health.—The Oklahoma State Medical Association and the state department of public health are cooperating in two institutes on wartime industrial health, one to be held in Tulsa at the Mayo Hotel, March 18, and one in Oklahoma City at the Biltmore Hotel, March 19. Dr. Henry C. Weber, Bartlesville, will open the program with a discussion on the "Purposes and Objectives of the Program on Industrial Health of the Oklahoma State Medical Association." Members of the state department of public health will discuss "Technical Assistance of the State Health Department Available to Industry." Among other speakers on the program will be:

J. J. Bloomfield, Bethesda, Md., Industrial Hygiene in War Production.
Dr. Carl M. Peterson, Chicago, Secretary, Council on Industrial Health, American Medical Association, General Relation of Medicine to Industry.
Dr. Clarence D. Selby, Detroit, Preemployment Examination and Placement.
Dr. William A. Sawyer, Rochester, N. Y., Conservation of Industry's Manpower.
Dr. John Albert Key, St. Louis, Medical Legal Phase and Evaluation of Disability.
A. G. Hewitt, Chicago, Management Looks at Industrial Health.
Dr. Louis Schwartz, Bethesda, Md., Occupational Diseases and Their Control.

PENNSYLVANIA

Society News.—Dr. Abraham H. Aaron, Buffalo, discussed "Use of Drugs by the General Practitioner" before the Northampton County Medical Society recently.——A symposium on the eruptive fevers was conducted before the Westmoreland County Medical Society, March 2, in Greensburg.

Philadelphia

A Million Persons Vaccinated.—On January 25 the Philadelphia *Enquirer* reported that the total vaccinations in the city's drive to prevent the spread of smallpox had reached more than 1,000,000. A reported total of 102,393 persons had been vaccinated in health centers, emergency stations and schools under the supervision of the city department of health since the program was inaugurated January 2. In addition, private physicians inoculated thousands more in their offices, in industrial plants, in hospitals and among the membership of various organizations. The drive against smallpox started following the outbreak in an Amish settlement in the Kishacoquillas Valley (THE JOURNAL, January 2, p. 61).

VIRGINIA

Awards for Research in State Hospitals.—To stimulate interest in professional work among the physicians on the staffs of the state hospitals, exclusive of the superintendents, prizes will be given each year for original or meritorious papers, based preferably on observations of patients under the physicians' care. The state hospital board, with the approval of the governor, has arranged to make available $500 each year for these awards, $250 for the first award, $150 for the second, $75 for the third, and $25 for an honorarium to some out of state authority who would pass on the relative merit of the papers. The papers may concern either one unusual case or a group of cases. The diseases discussed may be common or ordinary diseases in which careful study of the cases will bring out some new points. The papers need not necessarily deal entirely with the clinical or laboratory features but may cover reclassifications and deductions that have not heretofore been made. The papers should be handed to Dr. Hugh C. Henry, Richmond, state commissioner of mental hygiene and hospitals, by the first of June of each year and the awards made by the first of October.

GENERAL

National Negro Health Week.—National Negro Health Week will be observed throughout the country April 4-11. This year the theme will be "Health on the Home Front—Victory on the War Front."

Examinations in Ophthalmology.—The American Board of Ophthalmology announces that 1943 examinations will be held in New York, June 4-5, and Chicago, October 8-9. Application blanks may be obtained from the secretary of the board, Dr. John Green, 6830 Waterman Avenue, St. Louis.

Examination of Medical Technologists.—The Registry of Medical Technologists of the American Society of Clinical Pathologists announces that its spring examination will be held April 30, the closing date for the acceptance of applications to be March 10. Additional information may be obtained from Dr. Lall G. Montgomery, chairman of the board of registry, 2400 University Avenue, Muncie, Ind.

Officers of Federation of State Boards.—Dr. John F. Hassig, Kansas City, Kan., secretary of the Kansas Board of Medical Registration and Examination, was chosen president-elect of the Federation of State Medical Boards during its annual meeting in Chicago, February 16, and Dr. Frank M. Fuller, Keokuk, Iowa, chairman of the Iowa Board of Medical Examiners, was inducted into the presidency. Dr. Adam P. Leighton, Portland, Maine, secretary of the Maine Board of Registration of Medicine, was named vice president and Dr. Walter L. Bierring, Des Moines, state health commissioner of Iowa, was reelected secretary-treasurer.

Obstetric Examination in Pittsburgh.—The general oral and pathologic examinations (part II) for all candidates will be conducted in Pittsburgh by the entire American Board of Obstetrics and Gynecology from Wednesday, May 19, through Tuesday, May 25. Headquarters will be at the Hotel Schenley for the board, and formal notice of the exact time of each candidate's examination will be sent him several weeks in advance of the examination dates. Hotel reservations may be made by writing directly to the hotel. Candidates for reexamination in part II must make written application to the secretary's office not later than April 15. The Office of the Surgeon General of the U. S. Army has issued instructions that men in service eligible for board examinations be encouraged to apply and that they may request orders to detached duty for the purpose of taking these examinations whenever possible. Candidates in military or naval service are requested to keep the secretary's office informed of any change in address. Deferment without time penalty under a waiver of the published regulations applying to civilian candidates will be granted if a candidate in service finds it impossible to proceed with the examinations of the board. Applications are now being received for the 1944 examinations. For further information and application blanks, address Dr. Paul Titus, secretary, 1015 Highland Building, Pittsburgh.

Americans Do Not Eat Wisely, Says Gallup Poll.—A nationwide survey conducted by the American Institute of Public Opinion to determine how much the average American adult knows about simple nutrition rules revealed that the average American has much to learn about what to eat, the New York *Times* reported on February 8. A record of the principal foods eaten by representative adults in all states was compared with a list of essential health foods recommended by the Bureau of Home Economics of the Department of Agriculture and other nutrition experts. The following figures represent the number of persons who had none at all of the foods listed as necessary daily in each category:

Fruits and raw greens: tomatoes, citrus fruits or juices, raw cabbage, or salad green, 45 per cent had none.
Eggs: one a day, 48 per cent had none.
Milk and cheese, 34 per cent had none.
Vegetables: leafy green or yellow, 25 per cent had none.
Meats: meat, fish or poultry, 12 per cent had none.
Other vegetables (including potatoes) or fruit, 8 per cent had none.
Cereals or bread: whole grain or enriched, 3 per cent had none.

Sharp deficiencies in dietary habits were found in income groups. Among geographic sections the South shows a greater deficiency in citrus fruits and raw greens, while the New England and Middle Atlantic area shows greatest deficiency in milk or milk products.

Tropical Medicine Foundation Seeks to Raise $100,000.—The American Foundation for Tropical Medicine, Inc., at its annual meeting in New York on January 19, approved plans to secure $100,000 in gifts to provide for expansion of activities in the current year, including support of graduate departments of tropical medicine at American medical schools, grants for fellowships in tropical medicine, financial aid for exchange of faculty, support of technical journals in the field and support of research by grants in aid. Lieut. Col. Thomas T. Mackie, executive officer, Division of Parasitology and Tropical Medicine, Army Medical School, Washington, D. C., was elected president of the foundation. In 1942 he had been replaced as director by Dr. Jean A. Curran, dean and president of the Long Island College of Medicine, Brooklyn. Dr. Willard C. Rappleye, New York, was elected vice president, Mr. William W. Lancaster, New York, treasurer, and Mr. Alfred R. Crawford, assistant to Dr. Curran, secretary. An executive committee composed of Dr. Curran, Dr. Theodore G. Klumpp, New York, Colonel Mackie, Dr. Henry E. Meleney, New York, Dr. Rappleye, Mr. Lancaster and Mr. Crawford was named by the directors to serve for the current year. The directors also elected a medical committee made up of Col. Charles F. Craig, M. C., U. S. Army, retired, and Ernest Carroll Faust, Ph.D., New Orleans; Colonel Mackie; Dr. Meleney; Dr. Alfred C. Reed, San Francisco; Dr. George C. Shattuck, Boston, and Col. Joseph F. Siler, M. C., U. S. Army, retired, Washington, D. C. In addition to those named, the following were elected to membership in the foundation: Gen. Hugh S. Cumming, U. S. P. H. S., Washington, D. C.; Lieut. Col. Albert R. Dreisbach, M. C., U. S. Army, Washington, D. C.; Gen. George C. Dunham, M. C., U. S. Army, Washington, D. C.; Dr. Lester J. Evans, New York; Dr. Edward G. Huber, Newton, Mass.; Dr. Edward H. Hume, New York; Dr. Maxwell E. Lapham, New Orleans, and Dr. Edward I. Salisbury, New York. All correspondence should be addressed to Dr. Curran at 350 Henry Street, Brooklyn.

Health Advisory Council Organized.—The Chamber of Commerce of the United States on February 5 announced the creation of a National Health Advisory Council to consider national health problems in relation to the war program. Dr. James S. McLester, professor of medicine, University of Alabama School of Medicine, Birmingham, was chosen general chairman of the council. The new council will serve to channel approved technical health information developed by the country's many scientific associations to business organizations and their members throughout the country so there may be brought about a better public understanding and appreciation of medical

science as a means of safeguarding public health to win the war. It will work through the Chamber of Commerce of the United States as a central organization, which in turn will work through its membership of trade associations, chambers of commerce and corporations and firms. Membership of the council, which will be increased as work progresses, has been divided into three groups. Dr. Wilson G. Smillie, New York, is chairman of the community group including:

Dr. Paul D. White, Boston.
Dr. J. Burns Amberson Jr., New York.
Dr. George W. Kosmak, New York.
Dr. Ernest L. Stebbins, New York.
Mr. Bailey B. Burritt, New York.
Henry F. Vaughan, Dr.P.H., Ann Arbor, represented by Nathan Sinai, D.P.H.
George R. Cowgill, Ph.D., New Haven, Conn.
Dr. Harry Bakwin, New York.
Dr. Felix J. Underwood, Jackson, Miss.

Dr. Leverett D. Bristol, New York, is chairman of the industrial group, comprising:

Dr. Harvey Bartle, Philadelphia.
Dr. Anthony J. Lanza, Washington, D. C.
Dr. John J. Prendergast Jr., Detroit.
Dr. Loyal A. Shoudy, Bethlehem, Pa.
Dr. William A. Sawyer, Rochester, N. Y.
Mr. John D. Dorsett, New York.
Philip Drinker, Ch.E., Boston.
Dr. Harry E. Ungerleider, New York.
Dr. John J. Wittmer New York.
Mr. G. W. Hardy, Chicago.

Dr. James E. Paullin, Atlanta, Ga., President-Elect of the American Medical Association, is chairman of the individual group, which is composed of:

Dr. Leroy U. Gardner, Saranac Lake, New York.
Dr. George M. Piersol, Philadelphia.
Dr. Russell M. Wilder, Rochester, Minn.
Dr. Alfred Blalock, Baltimore.
Dr. Joseph C. Doane, Philadelphia.
Dr. Louis Hamman, Baltimore.
Dr. Wallace M. Yater, Washington, D. C.
Miss Marion G. Howell, R.N., New York, represented by Miss Marian Sheahan.
Dr. Arthur F. Chace, New York.
Dr. Harold M. Marvin, New Haven, Conn.

Accidental Deaths in 1942.—The National Safety Council announces that 93,000 deaths from accidents were reported in 1942 as compared with 101,513 in 1941. Of this group 27,800 were charged to motor vehicles in 1942 as against 39,969 in 1941. Accidental deaths in the home accounted for 30,500 against a similar total for 1941. Occupational accidental deaths totaled 18,500 as against 18,000 the previous year and public accidental deaths (not motor vehicle) totaled 15,500 as against 15,000 in 1941. The saving of 8,500 lives in 1942 as compared with the 1941 total is attributed entirely to a drop of 12,200 in traffic deaths accounted for largely by wartime restrictions on speed and travel. A total of 47,500 workers were killed by accidents in 1942, 18,500 on the job and 29,000 off the job. In addition, nonfatal injuries to workers totaled 4,100,000, of which about 1,750,000 were caused by occupational accidents. The all-accident totals include accidental deaths of military personnel not shown separately. Motor vehicle deaths include some which also are shown in other categories, such as occupational and home. Not only was the 1942 accident toll less than for 1941 and for most recent years but the death rate of 66.4 per hundred thousand population was the lowest since 1922, when it was the same. There were 9,300,000 persons injured in accidents last year, approximately the same as in 1941, despite the decrease in deaths. One out of every 14 persons in the United States suffered a disabling injury during the year. The estimated economic loss of $3,700,000,000 from accidents in 1942 covers both fatal and nonfatal accidents and includes wage losses, medical expense, the overhead costs of insurance and property damage from traffic accidents and fires. Children less than 5 years old were the only age group to show an increase in accidental deaths in 1942. Deaths in this group were up 2 per cent. The school child group (5 to 14 years) had a decrease of 9 per cent in fatalities. Falls brought accidental death to 24,000 persons in 1942, 4 per cent below 1941. Deaths from burns were up 17 per cent in 1942 to a total of 8,900. Even after excluding the Boston night club fire, the general trend of fatalities from burns was up approximately 10 per cent. Drownings totaled 7,000, an increase of 1 per cent. As in past years, the bulk of the accident total was made up of one-death accidents. Five fatal accidents occurred in 1942 in the domestic operations of scheduled air carriers. One was in January, two in May, one in October and one in December. Passenger deaths numbered 56 and plane crew deaths 15, making a total of 71. The passenger-mile total was approximately 1,490,000,000, which indicates a passenger rate of 3.8 per hundred million passenger miles. This was 65 per cent above the 1941 rate of 2.3 and was higher than the rates for 1939 or 1938. It was lower, however, than the rate for any earlier year. In 1932 the rate was 15. Railroad accidents caused 4,809 deaths in the first eleven months of 1942, excluding deaths which occurred more than twenty-four hours after the accident. This was 4 per cent more than the comparable 1941 total of 4,616.

College of Surgeons Plans War Sessions.—New developments in military and civilian medical and hospital service will be brought to members of the medical profession at large and hospital representatives through a series of twenty war sessions, beginning March 1, to be held throughout the United States under the sponsorship of the American College of Surgeons with the cooperation of other medical organizations and the federal medical services. Each war session will consist of an all day program, lasting from 9 a. m. to 10 p. m., including luncheon and dinner conferences. There will be eight meetings in each session, four of which will be for the entire assembly and the remainder divided into two meetings each for physicians and for hospital representatives. Subjects will be similar in the different places, but some of the speakers will be changed in the different states and service commands. Nationally known representatives of the United States Army, the United States Navy, the United States Office of Civilian Defense, the United States Procurement and Assignment Service and the United States Public Health Service will address the meetings and will lead discussions, in addition to participation by prominent leaders in civilian medical practice and hospital service. The schedule is as follows:

Monday, March 1: Minnesota, North Dakota and South Dakota, Lowry Hotel, St. Paul.
Wednesday, March 3: Wisconsin and Illinois, Schroeder Hotel, Milwaukee.
Friday, March 5: Indiana, Kentucky and Ohio, Claypool Hotel, Indianapolis.
Monday, March 8: Michigan, Statler Hotel, Detroit.
Wednesday, March 10: Pennsylvania and West Virginia, the William Penn, Pittsburgh.
Friday, March 12: New York and Ontario, Statler Hotel, Buffalo.
Monday, March 15: Massachusetts, Connecticut, Maine, New Hampshire, Rhode Island and Vermont, Statler Hotel, Boston.
Wednesday, March 17: New York City, Delaware and New Jersey, St. George Hotel, Brooklyn.
Friday, March 19: Virginia, District of Columbia and Maryland, John Marshall Hotel, Richmond.
Monday, March 22: North Carolina and South Carolnia, Charlotte Hotel, Charlotte.
Wednesday, March 24: Alabama, Florida and Georgia, Tutwiler Hotel, Birmingham.
Friday, March 26: Tennessee, Arkansas and Mississippi, Peabody Hotel, Memphis.
Monday, March 29: Texas and Louisiana, Rice Hotel, Houston.
Thursday, April 1: Kansas, Missouri and Oklahoma, President Hotel, Kansas City.
Saturday, April 3: Nebraska and Iowa, Fontenelle Hotel, Omaha.
Tuesday, April 6: Colorado, New Mexico and Wyoming, Cosmopolitan Hotel, Denver.
Friday, April 9, Utah and Idaho, Utah Hotel, Salt Lake City.
Tuesday, April 13, Southern California and Arizona, Biltmore Hotel, Los Angeles.
Friday, April 16: Northern California and Nevada, Fairmont Hotel, San Francisco.
Tuesday, April 20, Washington, Montana, Oregon and British Columbia, Olympic Hotel, Seattle.

Dr. Irvin Abell, Louisville, Ky., chairman of the board of regents of the college, in announcing the war sessions, said that, although participating states and provinces for each meeting have been designated to facilitate arrangements, there will be no geographic restriction on attendance, and those who plan to attend may select the place and time which are most convenient. The American College of Surgeons canceled its 1942 national meeting and is holding in abeyance plans for a clinical congress in 1943, in the meantime offering the regional meeting plan provided by the war sessions to save the time of the doctors and other personnel and to minimize transportation difficulties without sacrificing unduly during wartime the educational and stimulative benefits of medical assemblies.

CORRECTIONS

Carcinoma of the Prostate.—In the case reported on page 500 of THE JOURNAL for February 13 the total protein reported as 750 mg. per hundred cubic centimeters should read 7,500 mg. per hundred cubic centimeters. This very high figure, indicating the degree of "block," makes the response to orchiectomy two weeks after operation even more remarkable.

Experimental Fibroids and the Antifibromatogenic Action of Steroid Hormones.—In the article by Dr. Alexander Lipschütz in THE JOURNAL, Sept. 19, 1942, "the estrogenic" (p. 172, second column, line 25) should read "a gonadal"; "estrogenic" (p. 174, first column, lines 38 and 39) should read "masculinizing," and "fibromatogenic" (p. 175, first column, line 23) should read "antifibromatogenic."

Foreign Letters

LONDON

(From Our Regular Correspondent)

Jan. 9, 1943.

Medical Aid to Russia

The Anglo-Soviet Medical Council, under the chairmanship of Sir Alfred Webb-Johnson, president of the Royal College of Surgeons, has been in existence for a year. Its object is to send to Russia recent medical publications and to make Soviet work accessible here. Complete sets of the *Lancet, British Medical Journal,* the *Bulletins of War Medicine, Hygiene and Tropical Diseases, Proceedings of the Royal Society of Medicine, Journal of the Royal Army Medical Corps* and *Journal of Medical Science* have been sent. Recently *Reviews of British War Medicine,* consisting of specially written articles and translated into Russian, was presented to Mrs. Maisky, wife of the Russian ambassador. Three thousand copies of it have been printed and sent to Russia. It covers a wide range of subjects, including public health, vitamin therapy, bone surgery, treatment of burns and crushes, blood grouping and the care of stored blood, hospital infections of wounds, sulfonamide and penicillin treatment, treatment of gonorrhea, bacillary and amebic dysentery, typhoid, typhus, malaria, tularemia and venereal lymphogranuloma. A volume on thoracic surgery is in preparation.

Russian articles have been received by the council, mainly through the editor of the *Soviet War News,* and have been published in English medical journals. The Society for Cultural Relations with Russia has handed over books and pamphlets for translation. An appeal was made for translators from the Russian, and replies were received from sixty-six persons, mostly doctors.

A National Collection of War Injuries

The valuable collection of pathologic specimens formed in the last great war was destroyed when the Royal College of Surgeons was bombed in 1941. At the request of the War Office and the college, the Medical Research Council has undertaken to replace it by a national collection illustrating injuries of the present war, to comprise specimens, pictures, photographs and roentgenograms of lesions produced by missiles, war gas or explosion gas or by secondary missiles, such as fragments of masonry or débris, including crushing injuries, the effects of impact of blast wave in air or water and burns, together with the mode of repair, the consequences of infection and the results of treatment. Without the participation of the medical officers in the services such a collection can never become comprehensive. It is hoped that they will take every possible opportunity of contributing. Specimens may be sent to Prof. M. J. Stewart, Pathological Department, University of Leeds, or to Professor Hadfield, Hill End Hospital, St. Albans, Herts. As the value of a specimen often depends on the care taken in collection and the preliminary treatment, a leaflet circulated by the War Wounds Committee of the Medical Research Council offering suggestions on fixation and dispatch may be obtained from the Army Medical Department of the War Office.

New Element Discovered by English Woman

Not for the first time has a woman taken part in the discovery of a new element. In 1898 salts of radium, with the periodic number of 88, were prepared by M. and Mme. Curie, of whom an English woman, Dr. Alice Leigh-Smith, was a pupil. The wife of a British diplomat, she was the first woman in England to be awarded the degree of D.Sc. in nuclear physics. Under the auspices of the British Empire Cancer Campaign she conducted medical research from 1936 until the outbreak of war and initiated a new method of treating cancer. In July 1940 Dr. Walter Minder, director of the Radium Institute in Berne, announced the discovery, among the disintegration products of radioactive actinium, of extremely minute quantities of helvetium, periodic number 85, with properties allied to those of chlorine, bromine and iodine. The discovery was reported in the British scientific periodical *Nature,* but competent scientists expressed doubt whether the element existed on earth in nature. Subsequently Dr. Leigh-Smith, who was engaged in cancer research in Berne, observed in the behavior of radioactive reagents unaccountable irregularities which suggested the presence of some hitherto unidentified element generated on atomic disintegration. Proof of the discovery of a new element was obtained by the joint work of the two physicists at the Radium Institute, Berne. They have designated it "anglo-helvetium" to denote the collaboration of scientists of the two countries.

Medical Benefits to Natives Under British Colonial Rule

The question of the bearing of the Atlantic charter on the future of the British colonies and the effect of any international system which may arise after the war have begun to be discussed. Some recent criticisms of the government of our colonies has given rise to a vigorous defense in the House of Lords by Lord Cranborne, who has been a colonial administrator. He described the great benefits, of which the medical ones are not the least important, which our rule had brought. A comparatively small part of our empire was acquired by war and that generally at the expense of other European powers rather than directly from the natives. These colonies have been held mainly as buttresses of that sea power which had been the principal guaranty of the peace of the world. Much territory in Africa had been occupied for the campaign against the slave trade, and one colony in order to make a home for slaves set free.

Describing medical benefits he said that in Malaya in the last thirty-five years we reduced the death rate from 46 to 20 per thousand. We set up there hospitals and welfare centers. We introduced compulsory education for all Malay boys between the ages of 7 and 14 years. We developed the great rubber industries to the benefit not only of ourselves but of the natives and of the world. We transformed the island of Singapore from an unproductive stricken jungle into one of the great ports of the world.

We established medical schools in East and West Africa, Ceylon, Malta and Fiji, which turned out physicians. Nurses and medical auxiliaries also were trained. Important investigations were carried out by our own organizations and by the Rockefeller Foundation. Slowly but steadily the problems of malaria, yellow fever, venereal disease, malnutrition and tuberculosis were being tackled. In remote unhealthy fever ridden districts members of the colonial medical service were giving their lives for the welfare of the native population. We also promoted social security and established satisfactory labor conditions.

Control of Rubber Gloves

For the year 1943 the maximum number of pairs of rubber gloves obtainable by physicians is six, by midwives six, by district nurses not practicing as midwives four and by nurses in private practice two. Physicians can apply for "supplementary rations" but must give satisfactory reasons. These regulations do not apply to gloves required for work done in hospitals, nursing homes or other institutions, or done in extra-domiciliary practice on the behalf of such institutions.

The Diagnosis and Treatment of Tuberculosis

The minister of health has had under consideration the question of improved arrangements for improved treatment and early diagnosis of tuberculosis. He has issued a circular to the local health authorities pointing out the importance of providing means for miniature radiography, for which transportable equipment will be allocated to them. Arrangements are also

being made by the Ministry of Health for training the necessary staff for operating this new means of diagnosis. Its importance requires that the arrangements for miniature radiography should be standardized.

Financial assistance is to be made available to all persons who suffer loss or diminution of income while undergoing treatment for pulmonary tuberculosis, whether in an institution or at home, and who have one or more persons wholly or mainly dependent on them.

Antidiphtheria Drive

The Ministry of Health is making a drive to get as many children as possible inoculated against diphtheria. In 685 out of 1,440 local health districts it is reported that 50 per cent or more of the children between the ages of 5 and 15 years have been inoculated. The same result has been achieved for children aged 1 to 5 years in 247 districts. In 80 districts a percentage of 90 or more was attained.

Russell John Howard

The death of Russell John Howard has removed a well known surgeon and teacher. Born in 1875, he entered the London Hospital as a student in 1895 and graduated M.B.Lond. with first class honors and a gold medal. Adopting surgery, he took the M.S. with a gold medal and the F.R.C.S. in 1903. In 1908 he was appointed assistant surgeon to the London Hospital. There he became famous for his incisive style of teaching. "What is wrong with this patient?" he would say. When a student began "Well sir it might be—" Russell would reply "I didn't ask you what it might be. Surely you can have an opinion. I used to be wrong nine times out of ten. Now I'm wrong only seven times out of ten." He wrote a number of successful textbooks: "Practice of Surgery," "Surgical Nursing," "Surgical Emergencies" and "House Surgeon's Vade Mecum." Because of his teaching gifts he was described as an "institution" of the London Hospital, where he exercised a profound influence on many generations of students. After his retirement as surgeon to the hospital under the age limit, he continued to lecture on surgery and surgical nursing.

BUENOS AIRES

(From Our Regular Correspondent)

Dec. 25, 1942.

Aviators' Sickness

In a lecture recently delivered at the National Academy of Medicine of Buenos Aires, Dr. René Crouchet discussed the psychologic phenomena of aviators' sickness which are brought about by physiologic phenomena due to the variations of air pressure and of the amount of oxygen in the air, as well as by velocity and rapid acceleration. The body tolerates velocities of acceleration of from 6 to 14 g. and even 17 g. if acceleration is of short duration (from two to ten seconds). Prolonged velocity, poor hygienic practices, fatigue, overwork and intoxication are the causes of grave disorders. The use of sulfonamide compounds is prohibited. Tonics, especially vitamin A, are indicated to prevent and control physical fatigue and certain visual disorders.

Infant Mortality in Colombia

The infant mortality rate in Colombia is high. Death occurs from nutritional disorders the result of insufficient or improper feeding, even in infants of large cities. The figures of infant mortality during the first year of life were as follows: 38,561 deaths (30.5 per cent) in 1935, 37,839 in 1936, 39,418 in 1937, 43,809 in 1938, 45,523 in 1939 and 40,956 in 1940. The rate of mortality for children between the ages of 1 and 10 years was as follows: 24,489 children in 1935, 29,648 in 1940 and of figures ranging between the foregoing in the years from 1936 to 1939 with the exception of 1938, when the greatest rate of mortality was observed, that is 37,013 deaths.

Society Reunions

The second annual reunion of the Argentine Medical Association took place in Córdoba on the first week of December 1942. The speakers were Drs. Raúl F. Vaccarezza, Andrés R. Arena, Gonzalo Bosch and José Belbey. Official topics discussed were "Tuberculosis of Bovine Origin," "Care of the Insane" and "Medical Charlatanism."——The first Cardiologic Week was recently held in the National Academy of Medicine of Buenos Aires. The main topic of discussion was "Cardiac Insufficiency."

Prize for Research Work

The "Rodolfo Fitte" Foundation established a prize of 10,000 Argentine pesos ($2,500) for the best work on acute anterior poliomyelitis which is presented between January and December 1943. Argentine and Pan American investigators may enter the contest, details of which can be obtained from the president of the "Rodolfo Fitte" Foundation, Avenida Quintana 39, Buenos Aires.

Medical Societies

The Argentine Society of Proctology of Buenos Aires was recently established. Dr. Carlos Bonarino Udaondo is the president. The society aims to reunite Argentine proctologists in a specialized group and also to organize a Pan American Society of Proctology and to create postgraduate courses of proctology as a specialty.

Personals

Dr. Leo Eloesser, professor of clinical surgery, Stanford University School of Medicine, accepted the invitation of the Argentine medical profession through Dr. Oscar Ivanisevich, dean of the Instituto de Clínica Quirúrgica of Buenos Aires, and visited Argentina. He delivered several lectures before the Argentine Medical Association and other medical and surgical societies of Buenos Aires. In some of the lectures the speaker discussed "Treatment of War Fractures."

Dr. José Arce recently returned home from the United States, where he carried on important studies on organization and functions of blood banks. He will report in detail his observations to our government and will show the advisability of organizing blood banks in the various provinces of Argentina, at least one bank in every province.

Deaths

Dr. José J. Puente of Buenos Aires, a syphilologist and specialist in venereal diseases and the head of the Department for Prevention of Leprosy, Syphilis and Venereal Diseases of the National Department of Hygiene, recently died in that city.

Marriages

Howard W. Smith, Woodward, Iowa, to Miss Madeline Rue of Bismarck, N. D., in Des Moines, December 25.

Robert Cantrell Feamster, San Antonio, Texas, to Miss Helen Louise Greer of New Orleans, November 28.

Carey Addison Stone Jr., Crewe, Va., to Miss Cornelia Daniel Preston of Lewisburg, W. Va., January 7.

Le Roy F. Catterson, Oskaloosa, Iowa, to Miss Lucile Tindle of Malcom in Montezuma, December 13.

Charles James Frankel, University, Va., to Miss Gladys Louise Birmingham of Buena Vista, January 8.

Charles Hamilton Reid Jr., Winston-Salem, N. C., to Miss Elizabeth Ray of Chapel Hill recently.

William E. Morrow, Chicago, to Miss Margaret R. Leonard of Monmouth, Ill., December 31.

Clara Z. Joel, Richmond, Va., to Corporal Edward Fleisher of Bethlehem, Pa., January 5.

George R. Crisler, Winter Park, Fla., to Mrs. Jane Bacher in Miami recently.

Deaths

Wilmer Krusen ✦ Media, Pa.; Jefferson Medical College of Philadelphia, 1893; president of the Philadelphia College of Pharmacy and Science from 1927 to March 31, 1941, when he retired with the title of president emeritus; in 1902 became professor of gynecology and later emeritus professor of gynecology at the Temple University School of Medicine; in 1913 he was elected a trustee, in 1914 vice president and in 1927 honorary vice president of the university; director of public health from 1916 to 1920 and again from 1924 to 1928; member of the House of Delegates of the American Medical Association in 1917, 1918, 1919 and 1921; served as president of the Medical Club of Philadelphia, the Philadelphia Obstetrical Society, the Philadelphia Clinical Association and a member of the Philadelphia Rotary Club; was director of the Philadelphia Chamber of Commerce; a trustee of the Welfare Federation and a member of the board of county prison inspectors; had been director and vice president of the Public Charities Association of Pennsylvania; a member of the College of Physicians of Philadelphia; a fellow of the American College of Surgeons; served as gynecologist at the Samaritan and Garretson hospitals; a member of the board of trustees of the Philadelphia State Hospital; associated with the Jefferson, Temple University, City, Philadelphia General and Municipal hospitals; formerly a member of the advisory council of the Henry Phipps Institute; in 1916 received the honorary degree of doctor of laws from the University of Pittsburgh; the honorary degree of doctor of science was awarded to him by Temple University in 1927 and by Franklin and Marshall College, Lancaster, Pa., in 1933; in 1934 received the honorary degree of master of arts in medicine from the Hahnemann Medical College and Hospital; aged 73; died, February 9, of coronary infarction.

Lee Hollister Ferguson ✦ Cleveland; Columbia University College of Physicians and Surgeons, New York, 1917; director of student health service at Western Reserve University, where he was formerly demonstrator and clinical instructor in medicine; instructor in medicine at his alma mater from 1918 to 1920; research assistant, department of preventive medicine and hygiene, Harvard University, Boston, 1920-1921; had for several years been assistant supervisor of health education in the public schools of Cleveland; member of the National Tuberculosis Association, the Anti-Tuberculosis Association of Cuyahoga County, the American Association of College Health Services and the Cleveland Academy of Medicine; fellow of the American Public Health Association; a member of the board of trustees of the Cleveland Child Health Association; aged 57; died, January 27, in the Leonard C. Hanna House, University Hospitals, of Hodgkin's disease with terminal pneumonia.

Frank E. Detling ✦ Los Angeles; Northwestern University Medical School, Chicago, 1901; associate clinical professor of surgery, University of Southern California School of Medicine; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology and the Pacific Coast Oto-Ophthalmological Society; fellow of the American College of Surgeons; past president of the Los Angeles Eye and Ear Society and chairman of the eye and ear section of the California Medical Association; formerly otolaryngologist to the Graves Dispensary; attending and consulting otolaryngologist to the Children's Hospital and for many years senior otolaryngologist to the Los Angeles County Hospital; aged 66; died, December 25, of carcinoma of the stomach.

Charles Briggs Crittenden, Louisville, Ky.; Vanderbilt University School of Medicine, Nashville, Tenn., 1912; member of the Kentucky State Medical Association; served as director of the division of maternal and child hygiene of the state department of health of Kentucky; formerly registrar of vital statistics and commissioner of the department of public health of Tennessee; formerly health commissioner of Chattanooga, Tenn., and Wilkes-Barre, Pa.; had been health director of rural study of the American Public Health Association; past president of the Pennsylvania Public Health Association; at one time director of the Kirby Memorial Health Center, Wilkes-Barre; aged 54; died, January 15, of coronary occlusion.

Donald Da Costa Shira, La Rue, Ohio; Ohio State University College of Medicine, Columbus, 1914; member of the Ohio State Medical Association; during World War I served as a captain in the medical corps of the U. S. Army; served as health commissioner for Summit County from 1920 to 1922 and as director of health for the city of Akron from 1922 to 1927; at one time had been assistant secretary and medical adviser of the Ohio Public Health Association; for many years medical editor of *Ohio Public Health*; aged 55; died, December 30, of coronary occlusion.

Arthur Kehew Day, Concord, N. H.; Harvard Medical School, Boston, 1889; member of the New Hampshire Medical Society which in 1940 awarded him a fifty year membership gold medal; during the Spanish-American War served in the U. S. Army as a first lieutenant and assistant surgeon; for a number of years was school physician of Concord; for twenty-five years served as attending physician at the Margaret Pillsbury General Hospital; formerly U. S. Pension Examining Surgeon for Merrimack County; aged 80; died, December 31, of coronary thrombosis.

Charles Louis Ahner, Chicago; Bennett Medical College, Chicago, 1913; member of the Illinois State Medical Society; aged 75; died, January 10, in Kenilworth, Ill., of arteriosclerosis and myocarditis.

Theophilus Powell Allen ✦ New York; Columbia University College of Physicians and Surgeons, New York, 1923; member of the National Gastroenterological Association; served during World War I; aged 46; associate attending physician, department of medicine, St. Luke's Hospital, where he died, January 27, of rheumatic heart disease.

David Tarwater Austin, Sarasota, Fla.; Memphis (Tenn.) Hospital Medical College, 1911; captain in the medical reserve corps of the U. S. Army not on active duty; served overseas during World War I; aged 65; died, December 31, of myocarditis.

Alexander Aloysius Backiel, Chicago Heights, Ill.; Chicago Medical School, 1928; member of the Illinois State Medical Society; aged 43; on the staff of the Southtown Hospital, Chicago, where he died, February 1, of transverse myelitis.

Hinton Miller Belflower, Sycamore, Ga.; Atlanta College of Physicians and Surgeons, 1911; member of the Medical Association of Georgia; served as a member of the county board of education; aged 65; died, December 3, of cerebral hemorrhage.

Arthur Birt, Halifax, N. S., Canada; M.B., C.M. 1887 and M.D. 1898, University of Edinburgh Faculty of Medicine, Scotland; spent his earlier years of practice on the staff of an English mental hospital and as a ship's surgeon; died, November 19, in Wolfville of chronic subdural hematoma.

James R. Boring, Canton, Ga.; Atlanta College of Physicians and Surgeons, 1899; member of the Medical Association of Georgia; had recently been an examiner for the Cherokee County Selective Service System and served in the same capacity for the draft board during World War I; for twelve years served on the board of education of Canton; aged 64; died recently of acute coronary occlusion.

Clemens Bossard, Wauwatosa, Wis.; Hahnemann Medical College and Hospital, Chicago, 1885; aged 80; died, January 6, of coronary disease.

John Hammond Bradshaw, Orange, N. J.; College of Physicians and Surgeons, New York, 1884; member of the Medical Society of New Jersey; fellow of the American College of Surgeons; consulting surgeon to the Orange Memorial Hospital, Orange, and the Jersey City Hospital, Jersey City; in 1941 the Essex County Medical Society presented him with a scroll of appreciation for practicing medicine for fifty years or more; aged 82; was found dead, January 20, of illuminating gas poisoning, self administered.

William Branower ✦ New York; Columbia University College of Physicians and Surgeons, New York, 1904; specialist certified by the American Board of Anesthesiology, Inc.; member and in 1917 president of the American Society of Anesthetists, Inc.; member of the American Association for Thoracic Surgery; aged 61; attending anesthetist to the Mount Sinai Hospital, where he died, January 17, of coronary thrombosis.

William Charles Bristow ✦ Emhouse, Texas (licensed in Texas by years of practice); past president of the Navarro County Medical Society; aged 68; died, January 6, in the Navarro Clinic Hospital, Corsicana, of heart disease.

Ruth Gudrun Brogger, Orange, N. J.; Syracuse University College of Medicine, 1941; served as an intern at the Syracuse University Medical Center; aged 34; died, December 28, in the Hospital of St. Barnabas and for Women and Children, Newark, of acute leukemia.

George Edwin Brown, Hackensack, N. J.; College of Physicians and Surgeons, New York, 1875; formerly physician for the county's penal institutions and for the city board of health; aged 90; died, December 31, of arteriosclerosis.

Lewis Allen Buchman ✦ Canton, Ohio; University of Wooster Medical Department, Cleveland, 1903; for many years

chief of surgery at the Aultman Hospital, where he was president of the medical staff in 1939; served also as lecturer in the hospital's school of nursing; past president of the Canton Medical Society; fellow of the American College of Surgeons; served as a captain in the medical corps of the U. S. Army during World War I; aged 67; died, January 6, of Parkinson's disease.

Lyman Ambrose Burnside, Marshall, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1905; served during World War I; at one time associated with the U. S. Public Health Service and the Veterans Administration; aged 63; died recently in Biloxi, Miss., of heart disease.

Noah Arthur Burr, Higganum, Conn.; Yale University School of Medicine, New Haven, 1901; member of the Connecticut State Medical Society; at one time school physician in Manchester; formerly health officer of Haddam; aged 67; died, January 9, of cerebral hemorrhage.

Benjamin Charles Deeley, Pasadena, Calif.; University of Wooster Medical Department, Cleveland, 1908; member of the Ohio State Medical Association; aged 58; died, November 29, of cerebral hemorrhage due to arteriosclerosis.

James Lawrence Devlin, New York; Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1899; member of the Medical Society of the State of New York; formerly chief examiner of lunacy in New York City; member on the staff of the Murray Hill Hospital; served as physician for the Richmond County Jail; aged 65; died, January 11, in the Muhlenberg Hospital, Plainfield, N. J., of coronary thrombosis.

Joseph Francis Duane ✠ Peoria, Ill.; Rush Medical College, Chicago, 1903; member and at one time vice president of the American Academy of Ophthalmology and Otolaryngology; member of the staff of St. Francis Hospital; aged 62; died, January 21, of primary diffuse generalized amyloidosis.

Marion Alexander Duncan, Chanute, Kan.; Medical College of Indiana, Indianapolis, 1891; aged 87; died, January 10, of cerebral hemorrhage.

Frank Hamilton Dunklin, Gallatin, Tenn.; University of Tennessee Medical Department, Nashville, 1886; aged 79; died, January 2, of heart disease and chronic nephritis.

Darius Edrington, Avery, Texas; Memphis (Tenn.) Hospital Medical College, 1906; member of the State Medical Association of Texas; served as a first lieutenant in the medical corps of the U. S. Army at Camp Lee, Virginia, during World War I; for twenty years served as president of the school board; aged 60; died, November 20, of cardiorenal hypertensive disease.

Moosha Berkowitz Freid, New Rochelle, N. Y.; University of the City of New York Medical Department, 1895; member of the Medical Society of the State of New York; at one time attending physician at the Lebanon Hospital, New York; aged 78; died, January 21, of carcinoma of the intestine.

Sheridan C. Griffith, Worthington, Ohio; National Normal University College of Medicine, Lebanon, 1893; aged 76; died, January 8, in the Starling-Loving University Hospital, Columbus, of uremia.

Francis Royal Hendricks ✠ Ventura, Calif.; Jefferson Medical College of Philadelphia, 1924; served as physician for the Associated Oil Company in Ventura; aged 44; chief of the Foster Memorial Hospital, where he died, December 27, of coronary thrombosis.

Retta Gifford Kilborn, Toronto, Ont., Canada; Trinity Medical College, Toronto, 1891; for many years served as a medical missionary to China under the Women's Mission Board of the Methodist Church; professor emeritus of pediatrics in the faculty of medicine, West China Union University, and superintendent of the Hospital for Women and Children in Chengtu, Szechwan, China; aged 78; died, December 1.

Thomas Jackson Pennington, Nacogdoches, Texas; National University of Arts and Sciences Medical Department, St. Louis, 1917; member of the State Medical Association of Texas; county health officer; on the staff of the City Memorial Hospital; aged 57; died suddenly, December 26, of heart disease.

John Thomas Phillips, Long Beach, Calif.; Rush Medical College, Chicago, 1897; formerly local physician for the Great Northern Railroad, and president of the Security State Bank at Newport, Wash.; aged 71; died, December 6, of carcinoma.

Francis Marion Pitts, Des Moines, Iowa; Keokuk Medical College, 1891; aged 75; died, December 21, of diabetes mellitus.

Frederick Judd Rathbun ✠ New Windsor, Ill.; Rush Medical College, Chicago, 1913; aged 55; died, January 29, in the Galesburg (Ill.) Hospital of cerebral hemorrhage and arteriosclerosis.

Charles John Reynolds, Buffalo; Niagara University Medical Department, Buffalo, 1890; member of the American Society of Anesthetists, Inc.; aged 77; served on the staff of the Millard Fillmore Hospital, where he died, January 11, of carcinoma of the liver.

Benjamin Travis Robinson, New Augusta, Miss.; Medical Department of Tulane University of Louisiana, New Orleans, 1906; member of the Mississippi State Medical Association; from 1926 to 1932 director of the Perry County Health Department and part time health officer from 1932 to 1938; served during World War I; president of the South Mississippi Medical Society in 1940; aged 63; died, December 2, of a cerebral hemorrhage.

Linn L. Roebuck ✠ Marion, Ohio; Starling Medical College, Columbus, 1894; on the staff of the Marion City Hospital; aged 69; died, January 14, of coronary thrombosis.

Frank Charles Sarazin ✠ Superior, Wis.; Chicago Medical College, 1888; on the staffs of St. Mary's and St. Francis hospitals; aged 76; died, December 17, of coronary thrombosis.

Martin John Sauter, Newport, Ky.; Eclectic Medical College, Cincinnati, 1916; member of the Kentucky State Medical Association; served as coroner of Campbell County for many years; served during World War I; aged 50; died, January 2, in Lakewood, Ohio, of coronary disease.

James M. Talcott, Omaha; State University of Iowa College of Medicine, Iowa City, 1896; served as chief probation and parole officer for the federal government for eight years; at one time located at Crofton, Neb., and in 1909 was elected to the state legislature and remained as representative from his district for several years; aged 70; died, November 19, of heart disease.

James Richard Tarrant, Birmingham, Ala.; Medical College of Alabama, Mobile, 1887; aged 81; died, December 16, of coronary occlusion and generalized sclerosis.

William Franklin Temple, Boston; Harvard Medical School, Boston, 1911; member of the Massachusetts Medical Society; past president of the Boston Society of Anesthetists; served on the staff of the Massachusetts Women's Hospital; aged 55; died, December 25, at his home in East Pembroke of an acute kidney obstruction.

Edward K. Wolfe, Palouse, Wash.; Physio-Medical College of Indiana, Indianapolis, 1898; past president of the Whitman County Medical Society; for many years health officer; aged 72; died, December 4, in St. Ignatius Hospital, Colfax, of uremia and diverticulitis of the colon.

DIED WHILE IN MILITARY SERVICE

Pashupati Joseph Sarma ✠ Chicago; Hahnemann Medical College and Hospital, Chicago, 1916; served as associate professor of surgery at the University of Illinois College of Medicine; formerly associate in surgery at the Loyola University School of Medicine, where he was instructor from 1927 to 1929 and assistant in surgery from 1924 to 1927; specialist certified by the American Board of Surgery; fellow of the American College of Surgeons; on the staffs of the Ravenswood and Cook County hospitals; served during World War I; was called to active duty March 10, 1941 as chief of the surgical service at the Station Hospital, Camp Barkeley, Texas, with rank of lieutenant colonel and later was promoted to the rank of colonel in the medical corps of the Army of the United States; aged 49; died, January 21, in Fort Sam Houston, Texas, of coronary arteriosclerosis.

Benjamin R. Roman ✠ New York; University and Bellevue Hospital Medical College, New York, 1929; specialist certified by the American Board of Pediatrics, Inc.; on the staffs of the Park West Hospital and the New York Polyclinic Medical School and Hospital; began active duty as a captain in the medical corps of the Army of the United States Nov. 9, 1942; aged 37; died, January 16, at Modesto, Calif., in an automobile accident.

Henry Fischer Standerwick Jr., New York; Columbia University College of Physicians and Surgeons, New York, 1940; in August 1942 began active duty as a first lieutenant in the medical corps of the Army of the United States attached to Company B, 81st Armored Medical Battalion, 11th Armored Division, Camp Polk, La., where he died, January 5, of encephalitis, aged 28.

Bureau of Investigation

MISBRANDED PRODUCTS

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the United States Department of Agriculture

[EDITORIAL NOTE.—These Notices of Judgment are issued under the Food, Drug and Cosmetic Act and in cases in which they refer to drugs and devices they are designated D. D. N. J. and foods, F. N. J. The abstracts that follow are given in the briefest possible form: (1) the name of the product, (2) the name of the manufacturer, shipper or consigner, (3) the date of shipment, (4) the composition, (5) the type of nostrum, (6) the reason for the charge of misbranding and (7) the date of issuance of the Notice of Judgment—which is considerably later than the date of the seizure of the product and somewhat later than the conclusion of the case by the Food and Drug Administration.]

El Panel Cuban Honey.—Albert H. Hoffman, trading as Hoffman Health Products, Tampa, Fla. Shipped Oct. 14, 1939. Composition: ordinary honey. Misbranded because of false representations on label that this was a "wonder honey" in that it differed materially from ordinary honey; that it contained minerals that would help build bones, muscle and tissue, materially in excess of the amount of such minerals in ordinary honey; that it would supply the elements valuable in ailments resulting from mineral deficiencies in amounts materially in excess of those contained in ordinary honey; that it possessed proportionately high amounts of potassium, sodium, calcium, magnesium, iron, phosphorus, chlorine, sulfur, silicon and undetermined minerals; that it had value as a food, body builder and constructive nutritional factor materially in excess of that found in ordinary honey, and that it contained minerals and other nutritional elements lacking in other honeys, whereas it did not differ materially from the ordinary product. Further misbranded because of false and misleading label statements that it possessed efficacy as a dietary supplement in the treatment of sinus, coughs, asthma, hay fever, constipation, stomach ulcers and digestive elements and as a general tonic and body builder; that it had natural healing properties, was of greater value to both children and adults who are anemic, have poor appetite and other symptoms of run down condition; that it would alkalize, vitalize and upbuild the body, aid in preventing respiratory ailments and build resistance; would help remove mucus and be a boon to raw and inflamed respiratory tracts; that it would benefit bowel and colon trouble by helping to change the intestinal flora; that it contained a pollen which would counteract the pollen which causes hay fever; that it would benefit stomach disorders such as ulcers, and, among other things, would be a tonic, body builder and weight increaser.—[*D. D. N. J., F. D. C. 483; September 1942.*]

Hain Becompx Capsules.—International Vitamin Corporation, Brooklyn. Shipped Dec. 9, 1940. Adulterated because strength differed from and quality fell below that which it was represented to possess, namely, "each capsule contains: B_1—100 International (200 Sherman) Units," whereas it contained not more than 60 U. S. P. units of vitamin B_1 per capsule (or an equal amount of international units). Misbranded for the same reason. Product was also charged to be adulterated and misbranded under the provisions of the law applicable to foods, as reported in F. N. J. No. 2821.—[*D. D. N. J., F. D. C. 476; September 1942.*]

Klorseptic Oil.—Howard D. Day, trading as High Chemical Company, Philadelphia. Shipped between Jan. 12 and Feb. 14, 1940. Composition: essentially a semiviscous oil having the odor of eucalyptus and containing an organic chloride but no free chlorine. Misbranded because label statement "Klorseptic Oil is a . . . chlorinated topical dressing . . . containing approximately 25% chlorine" was misleading, since product contained no free chlorine. Further misbranded because of false and misleading label claim "Useful as a topical dressing in burns, infected wounds, both superficial and deep, Otitis Media and skin lesions," since the product would not be efficacious for such purposes.—[*D. D. N. J., F. D. C. 468; September 1942.*]

Klorseptic Ointment.—Howard D. Day, trading as High Chemical Company, Philadelphia. Shipped between Jan. 12 and Feb. 14, 1940. Composition: an amber-colored salve with a eucalyptus odor but no free chlorine. Misbranded because label falsely represented that it would be useful in treating wounds, lacerations, abrasions, burns and wherever a topical dressing is indicated.—[*D. D. N. J., F. D. C. 468; September 1942.*]

Kurex Diabetic Tonic.—Richard F. Hillgrove and Walter P. Weihe, trading as Curex Hillgrove Laboratories, Inc., Cincinnati. Shipped Sept. 26, 1940. Composition: essentially water, alcohol, reducing sugars and plant extractives including emodin-bearing drugs and a trace of unidentified alkaloids. Misbranded because label did not bear common or usual name of each active ingredient and kind, quantity and proportion of alcohol; further misbranded because of label representations that it would be efficacious in treating diabetes, enable a diabetic patient to eliminate the taking of insulin, was helpful in the treatment of blindness caused by diabetes, would heal ulcerated feet and legs caused by diabetes; would be efficacious in treating run down conditions and other ailments contracted by poor living circumstances; was a systemic tonic and would be efficacious in the treatment of many ailments common to bad blood and other conditions such as rheumatism and those caused by kidney disorders, and would restore loss of appetite and improve the nervous condition and general health.—[*D. D. N. J., F. D. C. 485; September 1942.*]

Lawrence Mack's Laxrid.—Lawrence Mack, Inc., Detroit. Shipped Jan. 6, 1941. Composition: essentially epsom salt, Glauber's salt, sodium bicarbonate, tartaric acid, citric acid and small amounts of sodium phosphate, potassium and sodium chlorides, saccharin and peppermint oil. Misbranded because directions for use on label were not suitable for a laxative and because claim on package and in circular of report of alleged laboratory test to the effect that examination had shown the product to be "entirely free from any of the poisonous and harmful substances listed below" gave the false impression that the product contained nothing deleterious. Further misbranded because statements in accompanying booklet entitled "How I Reduced" represented that use of "Laxrid" would "do away with excess weight," effect permanent reduction, relieve constipation, remove heaviness of body and bloated, sluggish feeling, relieve gas and acids and enable the user to get up full of vim, vigor and vitality.—[*D. D. N. J., F. D. C. 447; September 1942.*]

Mineralvita.—Mineralvita Sales Company, Toledo, Ohio. Shipped between Feb. 1 and 3, 1941. Composition: essentially sodium sulfate (1.3 per cent) and slaked lime (0.9 per cent), with only inconsequential traces of, if any, manganese peptonate, lithium carbonate, calcium phosphate, manganese, sulfate, dipotassium phosphate, disodium phosphate, lithium bromide, magnesium glycerophosphate, ferric phosphate and magnesium chloride. Adulterated because label falsely represented that the minerals in the latter group were present in consequential amounts and that if the product were taken in the recommended dosage in connection with regular meals it would furnish young and old their daily requirement of minerals; and that "Mineralvita" had been scientifically blended with the minerals found in the human system and then treated by a form of electrolysis which prepared them for assimilation into the blood stream. Misbranded for the foregoing reasons and because label claim as to mentioned minerals "treated by electrolysis . . ." was false and misleading since it did not reveal that any treatment by electrolysis to which the water may have been subjected had not affected its composition or quality in any manner. Further misbranded because name "Mineralvita" and statement on shipping case label, "Manufactured from nature's minerals to promote health and strength," were false and misleading since the product did not contain life minerals, was not manufactured from natural minerals and could not be depended on to promote health and strength.—[*D. D. N. J., F. D. C. 472; September 1942.*]

Nu-Vig-Or Laxative-Tonic.—W. B. Goebel, trading as Botanical Medicine Company, Kannapolis, N. C. Shipped between June 7 and 10, 1940. Composition: plant material including cloves, capsicum, an emodin-bearing drug such as senna, and a bitter principle such as gentian, with sulfur, sodium sulfate, magnesium carbonate and sodium bicarbonate. Misbranded because the label claim that the product was "a tonic" was false and misleading in representing that this mixture would restore vigor and supply new vigor.—[*D. D. N. J., F. D. C. 426; September 1942.*]

Petrodine.—Howard D. Day, trading as High Chemical Company, Philadelphia ("Prepared only by Iodine Products Co. . . . Philadelphia, Pa."). Shipped between Jan. 12 and Feb. 14, 1940. Composition: only one ingredient reported, 0.09 grain of elementary iodine per fluid ounce, whereas label declared presence of 0.2 grain of this substance, hence misbranded. Adulterated because strength differed from, and quality or purity fell below, the amount of elementary iodine represented on the label.—[*D. D. N. J., F. D. C. 468; September 1942.*]

R M Dietary Supplements Vitamin A and D.—Ryer Mouser, Los Angeles. Shipped Nov. 2, 1940. Adulterated because its strength differed from and its quality fell below that which it was represented to possess, namely, 3,140 international units of vitamin A and 314 international units of vitamin D per tablet, whereas it contained not more than respectively only 30 and 150 international units of these vitamins. Misbranded for the same reason. Further misbranded because container was so filled as to be misleading. Also misbranded and adulterated under provisions of the law applicable to foods, as reported in F. N. J. No. 2549.—[*D. D. N. J., F. D. C. 477; September 1942.*]

Rux Compound (Regular and Strengthened).—Williams S. L. K. Laboratories, Milwaukee. Shipped July 26, 1940. Composition: "Regular"—essentially sodium, potassium and strontium salts of salicylic, benzoic and acetic acids, and extracts of plant drugs including quassia, with saccharin and water, the total amount of salicylic acid being 21.1 grains per fluid ounce; "Strengthened"—essentially the same ingredients, salicylic acid being present in the amount of 32.8 grains per fluid ounce. These "compounds" were misbranded because of false label representations for their efficacy for pronounced pain and for relief of muscular pain and congestion.—[*D. D. N. J., F. D. C. 454; September 1942.*]

Vi-An Tablets.—Vegetrates, Inc., Los Angeles. Shipped Nov. 29, 1940. Adulterated because its strength differed from and quality fell below that which it was represented to possess, namely, 1,250 international units of vitamin A and 125 international units of vitamin D, whereas biologic assay showed that they contained respectively only 40 and 60 units of these vitamins. Misbranded because of false and misleading label statement, "Four tablets a day . . . furnish: Vitamin A . . . 5,000 I. U. . . . Vitamin D . . . 500 I. U." Also misbranded and adulterated under the provisions of the law applicable to foods, as reported in F. N. J. No. 2822.—[*D. D. N. J., F. D. C. 478; September 1942.*]

Correspondence

POSTOPERATIVE PULMONARY EMBOLISM AFTER THIGH AMPUTATION

To the Editor:—The statistics published by Veal in the January 23 issue of THE JOURNAL relative to the frequency of pulmonary embolism following thigh amputations are enhanced in value by comparison with the results of other workers in this field.

Over a period of fourteen years I have either personally performed or supervised 132 supracondylar amputations of the thigh, 32 for arteriosclerotic gangrene, 81 for diabetic gangrene, 9 for embolic gangrene and 4 for thromboangiitis obliterans. Of this group there have been seven sudden deaths either within forty-eight hours following operation or within a week, a percentage of 5. In none of these cases was ligation of the femoral vein performed. This is in strong contrast to Veal's percentage of 42.1 without ligation and 17.5 with ligation. Of the seven deaths in my series, the diagnosis between coronary artery thrombosis and pulmonary embolism was not clearcut nor was the diagnosis made at autopsy.

It is my belief that postoperative pulmonary embolism in thigh amputations can be minimized by getting the patient out of bed as soon after the operation as feasible. In my cases the very next day is usually the time for getting these patients up in a wheel chair. I believe also that the avoidance of the use of a tourniquet in the performance of the operation is another factor in preventing postoperative embolism.

SAUL S. SAMUELS, M.D., New York.

CONTINUOUS CAUDAL ANALGESIA IN OBSTETRICS

To the Editor:—Any advancement in the field of childbirth pain relief is highly welcomed and should receive prompt and due recognition. There are sufficient disadvantages and contraindications to the method, as indicated in the article of Gready and Hesseltine (THE JOURNAL, January 23). To those listed by them can be added the following, several of which have been observed in our clinic at Indiana University: It is exclusively a hospital procedure and therefore restricted to 60 per cent of laboring women. The necessity for a competent attendant further restricts the use of the method. The method is rather technical—at least the insertion of the caudal needle must be done by one specially trained—either the obstetrician or a resident. There is an undesirably high percentage of failures. Hingson and Edwards report 11 per cent, necessitating discontinuance of the method or supplementing other anesthesia. Such contraindications as hypotension, hypertension, placenta previa, local infection about the hiatus, hysteria and apprehensiveness are to be observed.

The use of a nylon ureteral catheter as employed by Manalan appears to afford certain advantages over the use of the needle: it is less likely to break, it eliminates the danger of piercing the dura, it can be passed higher if the curve of the sacral canal is exaggerated and it allows the patient more freedom in turning and lying on the back (Manalan, S. A.: Caudal Block Anesthesia in Obstetrics, *Indiana M. J.* **35**:564 [Oct.] 1942). There is a risk of vasomotor or shock reaction (Gready and Hesseltine, page 229, report such an accident in a case of hypertensive toxemia). The bladder urge is lost; urine escapes during contractions from pressure of the advancing part or has to be removed by catheter.

In all fairness, despite these objections, the several important advantages of continuous caudal analgesia should be enumerated: Labor is painless and comfortable, the patient feeling sufficiently at ease to enjoy reading and normal sleep. The patient retains all her faculties and has a normal toleration for fluids and food both during and immediately after labor. The method may be employed throughout labor. Labor is shortened. The method provides ideal safety for the infant, particularly the premature (narcotics and sedatives are eliminated, and the need for resuscitation is greatly minimized, probably the most important contribution of the method). There is unusual relaxation of the perineal musculature, lessening resistance to the advancing head and facilitating forceps delivery and breech extraction. There is no need for supplementary anesthesia for manual delivery or repair work. Uterine bleeding is diminished. Molding of the fetal head is almost negligible. Postdelivery complications appear to be reduced. At laparotomy the peritoneum is desensitized.

As long as a method of analgesia is applicable only to the minority of laboring women (those in hospitals having competent attendants) and must be administered by specially trained individuals, that method cannot be accepted as "the last word in obstetric analgesia."

This expression has been prompted in behalf of the average woman laboring in an average hospital and attended by an average attendant. It is predictable that the use of caudal analgesia as an obstetric relief will be limited eventually to selected cases conducted by extra competent hands.

C. O. MCCORMICK, M.D., Indianapolis.

SINUS BRADYCARDIA

To the Editor:—Relative to the significant communication on sinus bradycardia by Dr. Paul D. White (THE JOURNAL, Oct. 24, 1942, p. 642) it may be of interest to report briefly my experiences in the examinations of approximately 36,000 men aged 18 to 45 at this station.

Sinus bradycardia below 50 was observed in relatively few instances. A rate of 44 was the lowest noted, occurring in 2 men; 1 was an athlete (professional boxer), the other was not. The majority of the examinees exhibiting sinus bradycardia below 50 were either athletes or men engaged in strenuous activity. Many well known athletes examined at this station, including Al Hostak, former World's middleweight boxing champion, George Athans, Olympic diver from Canada, and college football players, revealed no sinus bradycardia. The absence of sinus bradycardia under 40 in 36,000 consecutive men would seem to indicate that sinus bradycardia of such pronounced degree is a rarity. However, it is possible that the nervous tension resulting from the induction examination was in part responsible for the absence in our examinees of the extreme degrees of sinus bradycardia to which White has drawn attention.

MORRIS WILBURNE, First Lieutenant, M. C., A. U. S.
Cardiologist, Examining Board, U. S. Army Examining and Induction Station, Tacoma, Wash.

"OCHRONOSIS OF THE SCLERA"

To the Editor:—I should like to call attention to the discussion of an article on page 1282 in the Dec. 19, 1942 issue entitled "Ochronosis of the Sclera and Cornea Complicating Alkaptonuria: The Literature; Report of Four Cases." In closing the discussion, Dr. Smith stated that "Sealock, Gladston [sic] and Steele have suggested that the continued high intake of vitamin C in early life may prevent the deposition of melanotic pigment in later years." We endeavored in the quoted article to express clearly the fact that our work had completely failed to suggest that vitamin C had any effect on the inborn error of metabolism known as alkaptonuria. We wished only to point

out that our studies did not necessarily preclude this possibility. Our statement is as follows: "It should be pointed out that the large doses of ascorbic acid were without visible effect on the ochronosis exhibited by the individual. However, these results do not preclude the possibility of a continued high intake of the vitamin in early life preventing the deposition of melanotic pigment in later years."

J. MURRAY STEELE, M.D.,
Welfare Island, New York.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

BOARDS OF MEDICAL EXAMINERS
BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, Feb. 20, page 618.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Parts I and II. Various centers, March 1-3. Exec. Sec., Mr. Everett S. Elwood, 225 S. Fifteenth St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Oral. Part II.* Chicago, June 6-7. Final date for filing application is 90 days prior to date of examination. Sec., Dr. P. M. Wood, 745 Fifth Ave., New York.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Oral. Part II.* Pittsburgh, May 19-25. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY: *Oral. Parts I and II.* New York, June 4-5. Chicago, Oct. 8-9. Final date for filing application is March 1. Sec., Dr. John Green, 6830 Waterman Ave., St. Louis.

AMERICAN BOARD OF OTOLARYNGOLOGY: *Oral.* New York, June 3-5. Final date for filing application is March 1. Sec., Dr. Dean M. Lierle, 1500 Medical Arts Bldg., Omaha, Neb.

AMERICAN BOARD OF PEDIATRICS: *Written.* Locally, Oct. 8. *Oral.* New York, Nov. 20-21. Final date for filing applications is Aug. 1. Starting July 1, 1943, Group I will be abolished. Sec., Dr. C. A. Aldrich, 707 Fullerton Ave., Chicago.

AMERICAN BOARD OF PSYCHIATRY & NEUROLOGY: Various centers, April or May. Final date for filing application is March 1. Sec., Dr. Walter Freeman, 1028 Connecticut Ave., N.W., Washington, D. C.

AMERICAN BOARD OF SURGERY: *Written. Part I.* March 25. Sec., Dr. J. Stewart Rodman, 225 S. Fifteenth St., Philadelphia.

Indiana June Report

The Indiana State Board of Medical Registration and Examination reports the written examination for medical licensure held at Indianapolis, June 16-18, 1942. The examination covered 15 subjects and included 100 questions. An average of 75 per cent was required to pass. One hundred and twenty-eight candidates were examined, all of whom passed. The following schools were represented:

School	PASSED Year Grad.	Number Passed
College of Medical Evangelists	(1942)	1
Loyola University School of Medicine	(1942, 3)	3
Northwestern University Medical School	(1942, 2)	2
Rush Medical College	(1941)	1
University of Chicago, The School of Medicine	(1937), (1942)	2
Indiana University School of Medicine	(1942, 105)	105
State University of Iowa College of Medicine	(1939)	1
University of Minnesota Medical School	(1929), (1933), (1941)	3
University of Oregon Medical School	(1941)	1
Jefferson Medical College of Philadelphia	(1941, 2)	2
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin	(1920)	1
Regia Università degli Studi di Roma. Facoltà di Medicina e Chirurgia	(1936)	1
Universität Bern Medizinische Fakultät	(1937)	1
Osteopaths *		4

* Examined in surgery only.

Nebraska November Report

The Nebraska State Board of Medical Examiners reports the written examination for medical licensure held at Lincoln, Nov. 23-25, 1942. Three candidates were examined, all of whom passed. The following schools were represented:

School	PASSED Year Grad.	Number Passed
Johns Hopkins University School of Medicine	(1939)	1
University of Nebraska College of Medicine	(1942)	1
Medizinische Facultät der Universität, Wien	(1937)	1

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice: Use of Allegedly Insufficiently Diluted Sodium Hydroxide in Allergy Test.—The plaintiff was suffering from asthma and went to the Sutter Hospital, owned and operated by the appellant, the Sutter Medical Service Company, hereinafter referred to as the hospital corporation. She was received by a receptionist, who "took her history," required her to pay $26.50 to the hospital cashier, apparently for prospective treatment, and referred her to Dr. Morgan, who was employed on a monthly salary as a resident physician in the hospital. Morgan, after examining her and a roentgenogram he had had taken, sent her to a technician in the hospital building for an allergy test. The technician scraped the plaintiff's left arm in twenty-four places and dropped a solution on each abrasion, which caused a sharp, intense burning sensation concerning which the plaintiff immediately complained as the solution touched each abrasion, but the technician nevertheless continued to apply the solution until it had been applied to each abrasion. A different powder was then applied to each abrasion. The arm swelled up and became very red and painful. The technician then scraped the right arm and applied different liquids, each from a small phial, to the abrasions on that arm, but there was no sensation of burning and no untoward developments in that arm from the procedures. The left arm continued to pain and burn and the plaintiff demanded that something be done for the left arm to prevent possible infection from her coat sleeve. Dr. Morgan was then called in and directed the technician to bandage the arm, which she did, and the plaintiff left the hospital. The plaintiff could sleep but little that night because of the burning pain in her left arm. The next morning the left arm was swollen and the abrasions thereon were all "kind of greenish and [there was] pus in these openings." The plaintiff returned to the hospital and was examined by Dr. Morgan and by Dr. Jacobs, the president of the hospital corporation. On Jacob's advice the plaintiff was admitted to and treated free of cost in the hospital. After two or three days when the patient seems to have been discharged the swelling and pain in the left arm subsided, but the abrasions "were red and yellow and green." Apparently as a permanent condition, there now are small scars on the left arm where the abrasions had been which become red when the plaintiff is warm or when she is not feeling well. Alleging that her injuries were due to negligent treatment, the plaintiff eventually sued the hospital corporation and Drs. Jacobs and Morgan. From a judgment for $3,750 rendered against the hospital corporation alone, the hospital corporation appealed to the district court of appeal, first district, division 2, California.

A group of physicians, denominated, according to the appellant hospital corporation, as the "Sutter Hospital Group of Doctors," all of whom it was alleged were employees of Jacobs, the president of the hospital corporation, had offices on the first floor of the building occupied by the hospital. While the hospital and the group of physicians had a common bank account and a common bookkeeping system, the hospital corporation contended that the physicians operated entirely independently of the hospital, the physicians in the group being all employed by Jacobs and the group paying rent to the hospital corporation for office space occupied by it and being paid for their services from receipts of the group by checks in the common bank account. The hospital corporation contended, therefore, that since the negligence, if any, that occasioned the injuries to the plaintiff was that of the technician, an employee, so it alleged, of the group of physicians and not an employee of the hospital, the hospital corporation could not be liable and that liability, if any, necessarily rested on Dr. Jacobs as employer of the technician. Since there had been a judgment for Jacobs and Morgan, the result of the contention of the hospital corporation, if sustained, would have been to leave the patient without remedy. The court, however, doubted the truth of the contention of the hospital corporation as to the actual arrangement between the hospital and the group of physicians con-

cerned. Dr. Morgan, said the court, testified that he was employed at a monthly salary by Dr. Jacobs "as a resident physician at the Sutter Hospital," that at the time of his employment Jacobs said nothing to him about the group of physicians and spoke only of his taking a position as resident physician and that he knew nothing about the group of physicians until the day that he was called to the witness stand. However all this may be, we do not find it necessary to inquire further into the intricacies of the relationship between the hospital corporation and the group of doctors here involved because we are satisfied that the verdict and judgment against the hospital corporation can well be rested on the doctrine of estoppel. From the facts here present the jury was entitled to find that the plaintiff, relying on appearances for which the hospital corporation was responsible, believed that she was contracting for medical services with the hospital corporation to be rendered by it or its agents and servants. Consequently the jury would be justified in finding that the hospital corporation was estopped to deny that the technician in giving the allergy test was its employee.

The hospital corporation apparently contended that since it could not legally practice medicine it could not be liable for the negligence of any of its servants attempting to practice medicine on its behalf. The fact, said the court, that the hospital corporation could not lawfully practice medicine does not avail it in an action instituted against it for the negligent act of its servants undertaking to practice medicine on behalf of the corporation. The medical service corporation either did contract, or led the patient to believe that it was contracting with her, for medical services. As was said in *Hannon* v. *Siegel-Cooper Co.*, 167 N. Y. 244, 60 N. E. 597:

> The public health law, by section 164, makes it a misdemeanor for any person to practice, or to hold himself out to the public as practicing dentistry . . . without being licensed to practice as such . . . and it would seem that the action of the defendant, in assuming to carry on the business of dentistry, was illegal and ultra vires. But, though it was beyond the corporate powers of the defendant to engage in the business, this does not relieve it from the torts of its servants committed therein . . . , and the unanimous affirmance of the appellate division is conclusive to the effect that it either practiced dentistry or held itself out as practicing dentistry.

The hospital corporation next contended that if it were held liable on the theory of estoppel to deny that the technician was its employee, the verdict in favor of Dr. Jacobs is fatally inconsistent with the verdict against the hospital corporation in view of the testimony of Jacobs and the technician that the technician was Dr. Jacobs' employee. In support of this proposition the hospital corporation probably relied on *Bradley* v. *Rosenthal*, 154 Cal. 420, 97 P. 875, which held that where master and servant are jointly sued for the alleged negligence of the servant alone, which the master did not direct and in which he did not participate, a verdict in favor of the servant relieves the principal of responsibility and may be availed of by the principal for that purpose. But, answered the appellate court, this case does not fall into that pattern. Here the act of negligence was that of the technician and not of Jacobs, and if Jacobs and the hospital corporation were liable they were both liable under the doctrine of respondeat superior. The hospital corporation's liability was in no sense dependent on any act of Jacobs, and vice versa. The technician was not a party defendant and was not exonerated by the jury. The rule applying to joint feasors generally is that judgment in favor of one joint tort feasor is not a bar to a recovery against the other. The court accordingly concluded that the judgment in favor of Jacobs cannot be taken advantage of by the hospital corporation on this appeal. The same result, in any event, said the court, can be as well reached in another fashion. If the hospital corporation is estopped to deny that the technician was its employee in administering the tests to the plaintiff, it would seem to be equally estopped to assert against the plaintiff that Jacobs was the employer of the technician.

The hospital corporation contended next, apparently, that the verdict against the hospital corporation must necessarily have been based on negligence on the part of the technician, which negligence finds no support in the evidence. The technician testified that the liquid she applied to the abrasions on the plaintiff's left arm, which was apparently the cause of the resulting injuries, was "tenth-normal sodium hydroxide solution which is admittedly standard for such tests." However, an expert witness produced by the plaintiff testified that such a solution is not harmful to the human body, but that sodium hydroxide is a caustic and in stronger solution will destroy the tissues. He testified further that very seldom does a reaction result from an allergy test in less than an hour and very seldom does any severe reaction from the skin-scratch test of the kind made on the plaintiff's left arm occur and that as a result of the performance of the test a slight burning might result, but definitely there would not result an intense burning. Another medical witness testifying for the hospital corporation stated that if a strong solution of sodium hydroxide was placed on a scratch pain would be manifest in "ten seconds at the most, maybe before," but that there would be no pain from a tenth-normal solution. This evidence, said the court, is ample, if believed by the jury, to support a finding that some corrosive liquid was applied to the plaintiff's left arm resulting in the injuries which she suffered.

The judgment in favor of the patient was accordingly affirmed. —*Hedlund v. Sutter Medical Service Co., 124 P. (2d) 878 (Calif., 1942).*

Drunkenness: Admissibility of Evidence of Blood Test.—The plaintiff's husband, a policeman, died as the result of an automobile accident. In a subsequent suit by the plaintiff for a writ of mandate to require the defendant city to make an order allowing her a pension because of the death of her husband, it appeared that at the time of the accident the deceased was under the influence of intoxicating liquor. From a judgment denying the pension, the plaintiff appealed to the district court of appeal, second district, division 2, California.

Among other things, the plaintiff contended that the trial court committed prejudicial error in receiving in evidence the opinions of certain doctors that the deceased was, at the time of his death, under the influence of an intoxicating beverage. These opinions were based solely on the results of tests made of the blood of the deceased taken from him after his death. But, said the court, the opinions of qualified medical doctors as to whether or not an individual is intoxicated, predicated on the percentage of alcohol in the individual's blood, although not conclusive, are admissible when there is a proper showing that the blood tests have been properly conducted. (*State* v. *Diguid*, 50 Ariz. 276, 72 P. (2d) 435; *Kuroske* v. *Aetna Life Ins. Co.*, 234 Wis. 394, 291 N. W. 384; *Commonwealth* v. *Capalbo*, 308 Mass. 376, 32 N. E. (2d) 225, J. A. M. A. **119**:583 [June 13] 1942). In the present case, since no objection was made that a preliminary foundation had not been laid for the admission of the testimony of the qualified physicians, the trial court properly permitted them to testify that in their opinion the decedent was intoxicated at the time of his death, since an analysis of his blood disclosed that it contained 0.28 per cent ethanol. Other contentions of the plaintiff were likewise overruled and the judgment in favor of the city was therefore affirmed.—*Lawrence v. City of Los Angeles, 127 P. (2d) 931 (Calif., 1942).*

Society Proceedings

COMING MEETINGS

Alabama, Medical Association of the State of, Birmingham, April 20-22. Dr. Douglas L. Cannon, 519 Dexter Ave., Montgomery, Secretary.

American Association of Anatomists, Montreal, Can., April 21-23. Dr. Francis H. Swett, Box 3701, Durham, N. C., Secretary.

Arkansas Medical Society, Little Rock, April 19-20. Dr. W. R. Brocksher, 602 Garrison Ave., Fort Smith, Secretary.

Conference of State and Provincial Health Authorities of North America, Washington, D. C., March 22-25. Dr. A. J. Chesley, 469 State Office Bldg., St. Paul, Secretary.

Florida Medical Association, Jacksonville, April 15-16. Dr. Shaler Richardson, 111 West Adams St., Jacksonville, Secretary.

Missouri State Medical Association, St. Louis, April 18-20. Mr. Raymond McIntyre, 634 North Grand Blvd., St. Louis, Executive Secretary.

Ohio State Medical Association, Columbus, March 30-31. Mr. Charles S. Nelson, 79 East State St., Columbus, Executive Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1932 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Surgery, New York

58:313-464 (Dec.) 1942

*Keloids: Review of Literature and Report of Eighty Cases. J. Garb, New York, and M. J. Stone, Stamford, Conn.—p. 315.

Treatment of Blood Stream Infections with Hemoirradiation: Case Reports. V. K. Hancock, Seattle.—p. 336.

Primary Brain Tumor: Follow-Up Study of 179 Cases. T. W. Botsford, Boston.—p. 345.

*Comparative Study of Local Burn Treatments. J. E. Hamilton, Louisville, Ky.—p. 350.

Syndrome of Acute Appendicitis: Frequency of Other Conditions Responsible for Symptoms. N. Rosenberg, New York.—p. 365.

Intestinal Anastomosis: Description of New Technic. H. I. Goodman, New York.—p. 368.

*Use of Sulfaguanidine as Intestinal Antiseptic. J. O. Vieta and Elizabeth Simon Stevenson, New York.—p. 377.

Five Years of Gallbladder Surgery in General Hospital: Review of 337 Consecutive Gallbladder Operations. Carmine Russo, Jamaica, N. Y.—p. 388.

Five Years of Gallbladder Disease at Autopsy in General Hospital: Review of 2,450 Consecutive Routine Autopsies. Carmine Russo and A. Angrist, Jamaica, N. Y.—p. 398.

Imponderables in Genitourinary Carcinoma. B. S. Barringer, New York.—p. 404.

Suture Dressing Anchor. J. L. Magrath, Upper Darby, Pa.—p. 407.

Abdominoperineal Operations for Rectal and Rectosigmoidal Cancer: New Modification of Miles Technic for Difficult Dissections. G. E. Binkley, New York.—p. 410.

Keloids.—The 80 cases of keloid that Garb and Stone report were treated in private practice and at the New York Post-Graduate Hospital from 1929 to 1940. The literature is reviewed to facilitate discussion of the theory and therapy of keloids. Hormone stimulation appears to be the main or the important contributing cause of keloid formation. The fact that the keloids of 23 of 67 patients whose ages were given occurred in the second decade and 12 per cent of keloids followed acne vulgaris also point to hormone stimulation. This view is further supported by the resolution or absence of keloids after the menopause and by their rarity in the aged, possibly the result of the diminution or disappearance of the male or female sex hormone. While keloids have distinctive, usually easily recognized, features there are numerous instances in which a differential diagnosis has to be made between keloids and hypertrophic scars, sarcoids, scleroderma, fibroma and paraffinomas. Epulis, some tumors of the throat, lung, stomach or ovaries and even esthiomene and rectal strictures are considered by many investigators as forms of keloidal growths. Primary union of a wound does not prevent the formation of keloids. Roentgen or radium treatment before or soon after excision of a keloid does not prevent its recurrence. A keloid of sufficient size should be first excised, wound healing hastened and x-rays or radium used at the first sign of recurrence. Among the authors' patients 2 are of particular interest: a girl of 18 whose hundreds of keloids did not respond to any form of therapy and a woman of 49 with extensive keloidal growths for fifteen years in whom deep ulcers and hyperkeratotic areas developed.

Treatment of Burns.—Since October 1939 Hamilton has compared the efficiency of foille (a thick, soapy, water-in-oil mildly antiseptic emulsion), cod liver oil, cod liver oil ointment, tannic acid with and without silver nitrate and 3 per cent sulfadiazine in 8 per cent triethanolamine in a large charity hospital with inadequate nursing care and lacking in ideal facilities for treating burns. Such conditions are likely to prevail in military hospitals in wartime. The series discussed consists of one hundred and ninety-nine burns in 192 hospitalized patients. Seven bilaterally similar burns were dressed with a different agent on either side. Thirty-eight of the 192 patients died. There is some slight excuse for this appalling figure: nursing care was inadequate, there were no facilities for isolation and/or special care, the amount of plasma available was greatly inadequate for 10 and moderately so for 6 patients, the burns of 6 patients involved 50 per cent of the total surface of the body and a number of patients were in the extremes of age or were suffering from serious organic disease. The postmortem examination of 12 revealed generalized congestion of viscera, especially of the lungs, intestine, adrenals and spleen. The liver was the organ most frequently and seriously deranged. From the mortality and survival rates foille, tannic acid and sulfadiazine were about equally effective in the saving of life. The burns treated with cod liver oil were too few and too small for the efficacy of this compound to be evaluated. Foille has been criticized on the grounds of the possible toxicity of its phenol content, but the author's impression and the mortality and survival statistics do not substantiate this criticism. Regarding the sloughing stage of third degree burns, it appears that burns treated with foille rid themselves of slough sooner than those dressed with other agents. Also with foille there was a significant reduction of healing time of the third degree burns over that with tanning or by the sulfadiazine spray. The second degree burns healed slightly earlier with leatherizing treatment than did those treated with foille. Foille appeared superior to the control agent in the 7 patients with bilaterally comparable burns who were treated simultaneously with two different agents. The sulfadiazine spray seemed to be somewhat more bactericidal than the other agents, at least for Streptococcus hemolyticus. In respect to relief of pain no pronounced difference between the agents was revealed, although tannic acid was somewhat superior and cod liver oil somewhat inferior. The end results are difficult to evaluate, but it appeared that the healing of the deeper burns, especially of the face, hands and flexures, was somewhat less painful and that there was less tendency toward contracture when they were treated with foille than when they were treated with other agents.

Sulfaguanidine.—Vieta and Stevenson used sulfaguanidine as an intestinal antiseptic in treating 20 women and 7 men between 31 and 72 years of age. They present a method of determining the presence of the drug in the feces. The administration of sulfaguanidine definitely reduced the coliform organisms in the intestine of 18 of the 27 patients. When ulcerative intestinal lesions were present, a significant reduction in the coliform organisms was not obtained by sulfaguanidine. This limits the beneficial results that could be expected. Its use altered the blood picture in only 1 of the 27 patients. Nevertheless it is advisable to check the blood counts of those receiving the compound in order to detect the occasional patient whose hemopoietic system is sensitive to it. The other 26 patients showed no other significant toxic reactions. Sulfaguanidine by depressing the coliform bacteria interferes with the synthesis or absorption of vitamin K by some patients. Crystalluria with subsequent formation of concretions might be considered a hazard, but this complication can be overcome by an adequate fluid intake. Sulfaguanidine is not the ideal chemotherapeutic agent for intestinal antisepsis. A sulfonamide which would destroy all the intestinal bacteria and still have the slow absorption and low toxicity of sulfaguanidine is the desired drug. The studies on absorption and excretion of the compound reveal that there is a decided variation in the amount of compound absorbed by each individual patient. However, unlike other sulfonamide compounds, sulfaguanidine is relatively poorly absorbed from the gastrointestinal tract and thus it remains in the intestine in a sufficiently high concentration and acts as a local chemotherapeutic agent. The portion (mean average 14.2 per cent) of the compound that is absorbed is rapidly eliminated in the urine, and high blood concentrations are not usually found.

Annals of Surgery, Philadelphia

116:801-970 (Dec.) 1942

*Carcinoma of Breast: I. Results of Treatment. C. D. Haagensen and A. P. Stout, New York.—p. 801.
Lymphedema of Arm Following Radical Mastectomy for Carcinoma of Breast: New Operation for Its Control. S. Standard, New York.—p. 816.
Extradural Hemorrhage in Anterior Cranial Fossa. S. W. Gross and N. Savitsky, New York.—p. 821.
*Massive Rupture of Liver. L. S. Pilcher, Newton, Mass.—p. 827.
Temporary Occlusion of Portal Vein and Hepatic Artery: Report of Successful Suture of Incised Portal Vein Within Liver. W. W. Babcock, Philadelphia.—p. 833.
Postmortem Peritoneoscopy: Means of Learning Peritoneoscopy. J. S. Chaffee, Cleveland.—p. 843.
*Role of Infection in Pathogenesis of Liver Necrosis in Hyperthyroidism. W. C. Sealy, Durham, N. C.—p. 851.
Cruveilhier-Baumgarten Syndrome (Splenomegaly, Portal Hypertension and Patent Umbilical Vein): Case Report. H. L. Valk and S. F. Horne, Winston-Salem, N. C.—p. 860.
Duodenal Tumor of Unusual Character. R. T. Shackelford, A. M. Fisher and W. B. Firor, Baltimore.—p. 864.
Volvulus of Cecum: Report of Four Cases. L. P. River and F. A. Reed, Chicago.—p. 874.
Leiomyosarcoma of Uterus. M. C. Wheelock and S. Warren, Boston.—p. 882.
Less Common Lesions of Astragalus. R. W. Lewis, New York.—p. 891.
Posterior Pituitary Extract in Anesthesiology. B. A. Greene, Brooklyn.—p. 898.
Regional Ileitis. L. Ginzburg and J. H. Garlock, New York.—p. 906.
Increasing Usefulness of Devine Colostomy in Left Colon and Rectal Surgery. C. G. Heyd, New York.—p. 913.
Metabolic Studies in Patients with Cancer of Gastrointestinal Tract: VII. Influence of Gastric Surgery on Chemical Composition of Liver. I. Ariel, G. T. Pack and C. P. Rhoads, New York.—p. 924.

Carcinoma of Breast.—Haagensen and Stout discuss the data from a punch card method utilizing a summary sheet listing some 700 different items found in the study of the mammary cancer of 1,040 women with proved or presumed carcinoma of the breast coming to the Presbyterian Hospital in 1915 to 1934. Of these, 986 were accepted for study and detailed unit records. The fact that in 6.6 per cent an unsuspected carcinoma was discovered during a routine physical examination is striking proof of the value of a careful and complete physical examination of every patient. Only 1.6 per cent of the patients sought medical aid because of pain in the breast. The cancers of 876 of 986 women were relatively operable and of 640 absolutely operable. In 236 a radical operation was not done because of constitutional inoperability, the extent of the carcinoma, death, refusal or primary erroneous diagnosis in 10. Of the 640 primary cases treated by radical mastectomy, 599 were followed until death or for a minimum of five years. The term "five year clinical cure" is used to designate the group of patients in whom no further evidence of cancer developed during the five postoperative years. Twenty patients died at operation, 41 were lost track of before the five years were up, 13 died of unknown causes and 12 of intercurrent disease during the five years, 290 died because of their disease, while 33 with recurrence and 231 without recurrence are alive five years after operation. A local recurrence developed in 146 and metastasis in 316 within five years of the operation. The earlier the patients came for treatment the better was their chance of clinical cure. The clinical cure rate of those in whom the disease was limited to the breast was approximately three times as high as of those in whom it extended to the axillary lymph nodes. The frequency of local recurrence appears to be similarly related to axillary involvement. Only from the knowledge obtained from an accumulation of actual measurement of the axillary nodes can one hope to become more expert in his judgment of axillary involvement. Preoperative radiation is not given to patients with operable carcinoma of the breast. Postoperative prophylactic radiation has not appeared to have had any demonstrable value. Palliative irradiation for recurrent disease has been of the greatest value in controlling pain due to bone metastasis and in clearing up small local recurrences in the operative field. When persistent pain develops in the back, pelvis or legs of a patient who has had a radical mastectomy for carcinoma irradiation is begun at once, even though roentgenograms fail to reveal any definite lesion of the bone. During the years covered by the present report there was an increasing tendency of the staff surgeons to lengthen the operative time and to increase the extent of the dissection. The evidence suggests that these more radical operations gave better results.

Massive Rupture of Liver.—Pilcher believes that his patient is the fourth to recover from massive rupture of the liver complicated by a triple rupture of the right kidney. The massive rupture was satisfactorily repaired with only three interrupted No. 2 chromic sutures. There was little postoperative oozing. This shows that when lacerated liver tissue is accurately approximated the ruptured bile sinuses and blood vessels heal rapidly. The danger of infection when bile sinuses are opened is well known, and it would undoubtedly be safer to assume that infection will be present and give sulfonamides (sulfanilamide locally and sulfadiazine by mouth or parenterally) from the beginning. The use of large gauze packs is at best a crude and primitive form of treatment and, although they may at times be a necessary life saving procedure, they must frequently be considered as a confession of lack of surgical judgment. As this case illustrates, some phases of surgery on the liver should not be considered hopeless.

Hepatic Necrosis.—With definite experimental evidence of the responsible factors of acute hepatic lesions in hyperthyroidism Sealy studied the 8 necropsy cases collected by the department of pathology of the Duke Hospital to determine whether hepatic necrosis existed in acute hyperthyroid reactions and, if it did, what its relation was to other factors. Seven of the patients died from an acute hyperthyroid reaction and 1 as a result of a pulmonary embolus on the fourteenth postoperative day. Evidence of acute pathologic changes of significant proportions was seen in the liver of 3 of the 8 patients. The structural alterations of 2 consisted in decided focal necrosis and fatty degeneration. The acute changes in 2 were complicated by moderate passive congestion, and in 1 in addition to these changes well defined periportal scarring and polymorphonuclear and lymphocytic cellular infiltration were seen. The areas of necrosis were focal and could be separated from the slight changes resulting from passive congestion. One of the 3 patients was apparently well prepared for operation and had no clinical evidence of cardiac failure; but passive congestion was present, even though death occurred only nine and a half hours after operation. Extensive central fatty change, associated probably with passive congestion, was present in his liver. The acute changes in the livers of the remaining 5 patients were insignificant. As to chronic lesions, such as periportal scarring, they were significant in 4 of the 8 and in 4 the damage was slight or absent. In 1 of the latter hyperthyroidism had been present for two years and in 3 only for six months. This seems to be significant; a similar relationship of the duration of the toxicity with the degree of chronic change has been observed by Beaver and Pemberton.

Journal of Immunology, Baltimore

45:157-236 (Nov.) 1942

Demonstration of Pneumococcus Antigen in Tissues by Use of Fluorescent Antibody. A. H. Coons, H. J. Creech, R. N. Jones, Boston, and E. Berliner, Cambridge, Mass.—p. 159.
Effect of Separate Inoculation of Serum and Virus on Protection Test in Vaccinia. R. H. Green and R. F. Parker, Cleveland.—p. 171.
Molecular Kinetic Analyses and Serologic Specificities of Polysaccharides Isolated from Filtrates of Human Tubercle Bacillus and Related Species. D. M. Tennent and D. W. Watson, Madison, Wis.—p. 179.
Agglutination by Anti-Hog Cholera Hyperimmune Serums of Antigen Obtained from Spinal Fluid of Pigs Infected with Hog Cholera and Adsorbed on Bacillus Prodigiosus. A. J. Weil, Pearl River, N. Y.—p. 187.
Specificity of Antibody Response of Human Beings to Strains of Influenza Virus. H. L. Bodily and M. D. Eaton, Berkeley, Calif.—p. 193.
Monovalent and Polyvalent Serums in Treatment of Pneumococcic Infections. G. F. Forster, E. H. Noblitt and E. N. Gilman, Chicago.—p. 205.
Type Specific Agglutinin Response of Infants and Children with Pneumococcic Pneumonias. M. Finland and H. I. Shuman, Boston, with technical assistance of Mildred W. Barnes.—p. 215.
In Vitro Titration of Horse Serums Containing Both Vibrion Septique and Perfringens Antitoxin. W. L. Koerber and E. Alture-Werber, New Brunswick, N. J.—p. 223.
Blood Group Factors in Blood, Organs and Secretions of Primates. A. S. Wiener, P. B. Candela and L. J. Goss, New York.—p. 229.

Journal of Lab. and Clinical Medicine, St. Louis

28:255-380 (Dec.) 1942

Epinephrine and Ephedrine Analogues and Their Clinical Assay. W. T. Baughan, R. M. Perkins and V. J. Derbes, Richmond, Va.—p. 255.
Effect of Testosterone Propionate in Treatment of Arteriosclerosis Obliterans. H. Zurrow, G. Saland, C. Klein and S. Goldman, New York.—p. 269.
*Study of Normal Cardiac Response to Water Below Body Temperature, with Special Reference to Submersion Syndrome. W. W. Tuttle and Joyce L. Templin, Iowa City.—p. 271.
*Etiology and Serum Treatment of Persistent Epidemic and Postoperative Hiccup. E. C. Rosenow, Rochester, Minn.—p. 277.
Circulating Time in Human Being and in Dog as Affected by Fasting and by Meals. I. M. Reingold, F. Neuwelt and H. Necheles, Chicago. —p. 289.
*Recurrent Attacks of Pneumococcic Pneumonia Treated with Sulfonamides. L. Schwartz, H. F. Flippin and J. H. Clark, Philadelphia. —p. 294.
Erythrocyte Sedimentation Rate Determinations on Normal Youths. C. F. Roche, D. G. Stannus and E. M. Isberg, Miami Beach, Fla. —p. 297.
Papillary Lymphoid Cystadenoma: Report of Four Cases. H. Peck, Hines, Ill.—p. 299.
Significance of Electrocardiogram with Prominent S Waves in Leads 1, 2 and 3. M. Wilburne and R. Langendorf, Chicago.—p. 303.
Electrolyte and Water Exchange Between Skeletal Muscle, "Available (Thiocyanate) Fluid" and Plasma in Dog Following Administration of Desoxycorticosterone Acetate. D. M. Harkness, E. Muntwyler, F. R. Mautz, Cleveland, and R. C. Mellors, Baltimore.—p. 307.

Normal Cardiac Response.—The effect on the heart from submersion incident to swimming in 68 college women was studied by Tuttle and Templin. In 7 there was no decrease in heart rate. On the average, the decrease in the 61 was 13 beats per minute, which is practically the same as that reported for men. The extent of the decrease varied directly with the resting pulse rate. There were two possible explanations for the abnormal response of the 7 girls who failed to respond normally to submersion in water: lack of psychologic (emotional) adjustment; that is, they were afraid, and lack of physiologic adjustment. When emotional factors are controlled, failure to experience a significant drop in pulse rate during submersion in water below body temperature indicates sensitivity to the water. "Submersion syndrome" is suggested for the conditions that prevent a normal adjustment to submersion in water.

Epidemic and Postoperative Hiccup.—The study of the epidemiologic characteristics, etiology and serum treatment of persistent epidemic hiccup has been extended by Rosenow to that of persistent postoperative hiccup. The cases studied culturally and those in which serum was used in treatment were seen chiefly at the Mayo Clinic. Persistent hiccup occurred in unusual numbers throughout the spring and autumn of the years of this study (1927 to 1941). It was related to mild outbreaks of respiratory infection. It usually occurred in men from 17 to 82 years of age. The data from laboratory studies (isolation of the spasm producing type of streptococcus from the nasopharynx, milk supplies and outdoor air during epidemic prevalence of hiccup and certain respiratory infections and from the air of rooms occupied by persons having persistent hiccup) indicate that the incidence of epidemic and postoperative hiccup is increased when streptococci normally present in throats of persons and in nature generally acquire spasm producing properties or virulence. Persistent epidemic and postoperative hiccup are considered to be forms of mild myoclonic encephalitis. The inciting agent is a streptococcus (Streptococcus singultus) closely related to the streptococcus of epidemic encephalitis. Antistreptococcus serum for epidemic encephalitis is curative in persistent hiccup.

Pneumococcic Pneumonia Treated with Sulfonamides.—Schwartz and his collaborators compare the therapeutic effectiveness and toxicity of the sulfonamides in the treatment of recurrent pneumococcic pneumonia in 24 patients. The time interval between readmissions (1 patient was readmitted twice) ranged from four to ninety-two weeks, with an average of thirty-seven weeks. Typable pneumococci were found in the sputum or blood stream of 35. The same pneumococcus type was the causative agent of subsequent attacks in only 4 patients. There were two deaths among the twenty-five subsequent admissions, both of patients with type III pneumonia. The first attack of 17 patients was treated with sulfapyridine and the result was good in 13 and fair in 4, and good in 4 and fair in 3 of the 7 treated with sulfathiazole. For the subsequent attacks the figures for sulfapyridine are 8 and 1 (and 1 patient died), for sulfathiazole they are 8 and 1, and for sulfadiazine they are 4 and 1. The third attack of the 1 patient who died was treated with sulfapyridine. The drugs appear just as effective for subsequent attacks as for the initial one. There was no evidence suggesting that the repeated use of a sulfonamide increased the incidence or severity of drug toxicity. Vomiting and microscopic hematuria were the only toxic reactions worth mentioning.

Kansas Medical Society Journal, Topeka

43:477-510 (Dec.) 1942

Fundamentals of Psychiatry: III. Mental Hygiene. W. C. Menninger, Topeka.—p. 477.
Sulfathiazole. R. H. Forney, Topeka.—p. 482.
Shawnee County Medical Care Plan. R. W. Callahan, Topeka.—p. 483.

Michigan State Medical Society Journal, Lansing

41:1013-1090 (Dec.) 1942

Response of Tumors to Radiation. S. Warren, Boston.—p. 1039.
Child Guidance Program of Michigan Hospital Commission. F. F. Tallman, Lansing.—p. 1041.
Nodular Symmetrical Lipomatosis: Review of Literature and Report of Case. J. C. Foshee and J. B. Wilkes, Grand Rapids.—p. 1043.
Establishment of Michigan Board of Health. E. E. Kleinschmidt, Chicago.—p. 1046.
*Mediastinal Glands in Undulant Fever. W. S. Martin, Ludington. —p. 1051.
Acute Laryngotracheobronchitis. W. P. Work, San Francisco.—p. 1052.
Trigeminal Teratoma of Sacrum. N. Huene, Traverse City.—p. 1056.
Rupture of Heart: Report of Two Cases and Postmortem Findings. V. W. Jensen, Shelby.—p. 1057.
Lipomatous Replacement of Left Gastrocnemius and Soleus Muscles Subsequent to Muscle Atrophy: Report of Case. H. M. Weaver and M. E. Maun, Detroit.—p. 1060.

Mediastinal Glands in Undulant Fever.—In an attempt to explain the pathologic changes that cause the dry, irritative and nonproductive cough in undulant fever, Martin presents histories of 3 of 6 patients with this type of cough. In all 6 the roentgenogram revealed moderate and decided enlargement of the mediastinal nodes. In 3 of them the agglutination was never positive, but in the other 3 it was conclusive.

New England Journal of Medicine, Boston

227:727-770 (Nov. 12) 1942

Cholangiographic Artefacts Resembling Common Duct Stones. H. M. Clute and K. B. Lawrence, Boston.—p. 727.
*Hemolytic Streptococcus Bacteremia: Report of Thirteen Cases with Special Reference to Serologic Groups of Etiologic Organisms. L. A. Rantz and W. M. M. Kirby, San Francisco.—p. 730.
Phonocardiographic Studies in a Case of Paroxysmal Tachycardia. H. Weyler and C. C. Dustin, Providence, R. I.—p. 733.
Orthopedic Surgery. G. W. Van Gorder, Boston.—p. 737.

227:771-812 (Nov. 19) 1942

Sequelae of War Head Injuries. D. Denny-Brown, Boston.—p. 771.
Acute Perforation of Ulcers of Stomach and Duodenum. H. Ulfelder and A. W. Allen, Boston.—p. 780.
Paroxysmal Tachycardia in Pregnancy. H. Weyler and C. C. Dustin, Providence, R. I.—p. 785.
Governor's Address. R. O. Blood, Concord, N. H.—p. 787.
Pharmacology and Pharmacotherapy. H. B. Friedgood, Boston.—p. 788.

227:813-856 (Nov. 26) 1942

Sequelae of War Head Injuries (concluded). D. Denny-Brown, Boston. —p. 813.
Myeloid Metaplasia of Spleen with Acute Hemolytic Anemia: Report of Case. H. H. Brewster and O. J. Wollenman Jr., Boston.—p. 822.
Dural Constricting Ring with Cervical Protruded Intervertebral Disk: Report of Case. W. G. Haynes, Fort Devens, Mass.—p. 825.
Diagnostic Value of Serial Measurements of Albuminuria in Ambulatory Patients. H. A. Derow, Boston.—p. 827.
Cancer. I. T. Nathanson, Boston.—p. 830.

Hemolytic Streptococcus Bacteremia.—Rantz and Kirby point out that other than group A hemolytic streptococci are frequently the cause of serious infection in man. In only 6 of the 13 consecutive cases of hemolytic streptococcus bacteremia observed by them in Stanford University Hospitals were group A organisms the etiologic agents. In 4 the hemolytic streptococci were of group B, in 1 of group C, in 1 of group D and for 1 the data are not given. On sulfonamide therapy 2 patients recovered and 2 died. The favorable effect of sulfadiazine in 1 of them with pneumonia and suppurative arthritis complicating chronic lymphatic leukemia was most remarkable. Two patients

with group B infection were treated with sulfapyridine; in 1 postoperative meningitis appeared to be subsiding at the time therapy was instituted and in 1 with puerperal sepsis sulfanilamide was without effect, but a change to sulfapyridine was followed by prompt recovery. One patient with group C infection recovered after sulfadiazine therapy in spite of aplastic anemia with agranulocytosis. The drugs of the sulfonamide group have been demonstrated in a previous study to be without effect in group D infection. Evidence suggests that sulfanilamide may not be of value in serious group B infection. The determination of the serologic group of the streptococcus is chemotherapeutically of definite importance.

New Jersey Medical Society Journal, Trenton

39:615-676 (Dec.) 1942

Acute Abdomen in Infancy. H. A. Murray, Newark.—p. 617.
Public Health in Wartime. R. C. Williams, New York.—p. 619.

Oklahoma State Medical Assn. Jour., Oklahoma City

35:499-544 (Dec.) 1942

Functional Cardiovascular Disorders Including Soldier's Heart. G. Herrmann, Galveston, Texas.—p. 499.
Atypical Pneumonia. S. Goodman, Tulsa.—p. 504.
Weight Gain of Pregnancy. J. L. Duer, Woodward.—p. 509.

Public Health Reports, Washington, D. C.

57:1843-1882 (Dec. 4) 1942

Incidence of Cancer in Philadelphia, Pa., 1938. H. J. Sommers.—p. 1843.
Changes in Mortality Rates, 1930 to 1940. H. F. Dorn.—p. 1858.
Ixodes Baergi, New Species of Tick from Arkansas (Acarina: Ixodidae). R. A. Cooley and G. M. Kohls.—p. 1869.

Radiology, Syracuse, N. Y.

39:513-646 (Nov.) 1942

The Cyclotron: A Nuclear Transformer. P. C. Aebersold, Berkeley, Calif.—p. 513.
Use of Radioactive Tracers in Biology and Medicine. J. G. Hamilton, Berkeley, Calif.—p. 541.
*Therapeutic Use of Artificially Produced Radioactive Substances: Radiophosphorus, Radiostrontium, Radioiodine, with Special Reference to Leukemia and Allied Diseases. B. V. A. Low-Beer, J. H. Lawrence and R. S. Stone, Berkeley, Calif.—p. 573.
*Further Experiences in Treatment of Lymphosarcoma with Radioactive Phosphorus. J. M. Kenney and L. F. Craver, New York.—p. 598.
*Treatment of Cancer with Fast Neutrons. R. S. Stone and J. C. Larkin Jr., San Francisco.—p. 608.
Effects of X-Rays and Neutrons on Mouse Lymphoma Chromosomes in Different Stages of Nuclear Cycle. A. Marshak, Berkeley, Calif.—p. 621.

Therapeutic Use of Radioactive Substances.—Low-Beer and his associates review the physical and biologic background of internal radiation therapy. The distribution and metabolism of radioactive phosphorus in animal and in human tissue indicate its therapeutic value for certain diseases, particularly chronic leukemia and polycythemia vera. The therapeutic effect of a millicurie of radiophosphorus is not to be expected to be comparable to a millicurie of radon. The internal use of radiating agents, such as radiophosphorus, requires a new orientation of the concept of the distribution of radiation in the body. A means of calculating the "radiation level" in the body of a patient on any day after either one or multiple doses of radiophosphorus is described, and although it does not account for the selective distribution of the radiating agent and cannot be exactly accurate for any single patient, owing to different rates of elimination, it does provide a more satisfactory means of approximating the active amount of radiation at any given time than do dose and the time of administration. The determination of the "radiation level" is of greater value with small, frequently repeated doses than when single doses are used at long intervals. Small fractionated doses seem justified for the following reasons: 1. By keeping a fairly constant, though low, level of radiation in the body for a considerable time, more cells are likely to be affected during their most sensitive period. 2. As actively growing cells take up a greater proportion of phosphorus than "resting" cells, a continuous supply of radioactive phosphorus is more likely to result in the radioactive atoms getting into dividing cells. It is too soon to compare the results of infrequent single with fractionated radiophosphorus treatment and also with other methods, but some remarkable and some unsatisfactory responses have been obtained with varying dose methods in chronic myelogenous leukemia, chronic lymphatic leukemia and lymphosarcoma. Until end results justify frequent small doses, this technic cannot be advocated as the method of choice. The treatment of polycythemia vera differs from that of the three aforementioned diseases in that the aim is to influence the erythropoietic tissue adversely instead of trying to "protect" it. A higher level of radiation is required. Many complete remissions have been produced. Patients with Hodgkin's disease have not had as satisfactory responses as those with lymphosarcoma. Multiple myeloma and widespread metastasis from carcinoma have proved resistant, even though a few satisfactory palliative results have been obtained. The use of other radioactive elements (strontium, iodine, element 85 and phosphorus in chromium phosphate) is proving their value in some conditions. The use of radioactive elements in various compounds which might localize in certain tissues is an unexplored field with great potentialities.

Treatment of Lymphosarcoma with Radioactive Phosphorus.—The results of radioactive phosphorus therapy in 22 unselected patients with lymphosarcoma have been carefully studied and analyzed by Kenney and Craver. Ten, or 46 per cent, of the 22 patients are living; 4 of them have had complete remissions and have had no recurrence for three to twelve months, 2 have had recurrences which were controlled by additional therapy, in 3 the disease has regressed 75 per cent and in 1 about 50 per cent. Six of the 10 living patients have had previous roentgen therapy, which had controlled the disease completely in 3 and partially in 3. Of the 12 patients who died 10 were never benefited by isotope therapy. Eleven received roentgen therapy without effect subsequent to the radioactive phosphorus. Five of these had had roentgen therapy prior to treatment with radioactive phosphorus, with partial control in 2 and no control in 3. The disease of 5 was clinically classified as leukosarcoma, the acute phase of lymphosarcoma. The period of remission, which is still unbroken in the successfully treated patients, has been longer in 2 patients than after previously administered courses of roentgen therapy. In 5 of these patients the remissions have been longer than the average of six to nine and a half months given by Medinger and Craver for roentgen treated patients. A tentative method, based on the differential absorption ratio, for selecting patients suitable for radioactive phosphorus therapy and for determining whether to use it as a primary or secondary method is outlined. From the results, it appears that the therapy should be used primarily or secondarily for virtually all cases of lymphosarcoma.

Treatment of Cancer with Fast Neutrons.—Between December 1939 and Sept. 15, 1941 Stone and Larkin treated the cancers of 120 patients pronounced incurable by surgical or roentgen measures with the 60 inch cyclotron producing neutrons with 16 million electric volts of energy. The anatomic distribution of the lesions was the tongue 18, prostate 18, skin and lip 13, floor of the mouth and alveolar ridge 13, breast 11, larynx and pyriform sinus 9, stomach and intestine 9, buccal mucosa 5, brain 4, nasopharynx 3, parotid 3, esophagus 2 and miscellaneous 12. Only 1 patient had a small localized tumor, 31 had lesions with definite local extension without metastasis, 34 had advanced primary lesions and metastasis and 49 had recurrences, usually after previous roentgen or radium treatments. Of the 120 patients 61 had died by Oct. 15, 1941. The encouraging facts are that, of those who were alive on Oct. 15, 1941, 9 had survived almost one year, 3 for twelve to fifteen months and 10 for more than fifteen months. Sixteen of those who survived had cancer of the prostate—a disease that does not always cause rapid death even if untreated. Of the 61 patients who died 26 did so either because their tumors were uncontrolled or because irradiation brought about conditions incompatible with life, and 31 had a gross tumor at the time of death in the region treated. Twenty-nine of the 41 patients with cancer of the mouth or throat had persistent ulceration at the time of death. At the end of treatment about 17 per cent of them showed complete regression and about 48 per cent showed partial regression of the tumor. After trials of various technics, it was concluded that 70 to 75 neutrons, as measured in the authors' laboratory, given to a single field with no cross fire on alternate days, was best. As judged by the minimal

threshold skin reaction, 1 neutron was found to be equal to 6 roentgens. As judged by the cutaneous reaction occurring about the neck and face, about 700 neutrons to a single field and 500 neutrons to two opposite fields administered in about twenty-six days produce an epidermitis which heals satisfactorily. The data demonstrate that cancer can be favorably influenced by neutron therapy and that normal tissue recovers from specific exposures. Therefore it should now be permissible to treat small cancerous lesions, which are more likely to be "cured" than the extensive ones. Further studies must establish the methods best suited to neutron therapy.

Review of Gastroenterology, New York

9:393-466 (Nov.-Dec.) 1942

Traumatogenic Peptic Ulcer. R. H. Fowler, Newark, N. J.—p. 393.
Gastroscopic Diagnosis of Ulcerative Lesions of Stomach. D. T. Bonham, Hempstead, N. Y.—p. 404.
Pernicious Anemia Alternating with Polycythemia (Polyglobulia). H. I. Goldstein, Camden, N. J.—p. 406.
Role of Gram Positive Diplococcus and Other Pathogens in Stagnant Colon. M. Smith, Miami, Fla.—p. 411.
Roentgenologic Demonstration of Duodenal Bulb Without Use of Contrast Mediums. M. Feldman, Baltimore.—p. 422.
Probable Left Upper Quadrant Appendicitis Due to Partial Nonrotation of Colon: Case. J. Lichstein, Philadelphia.—p. 424.
Sulfanilamide and Appendicitis. H. Reich, Newark, N. J.—p. 427.
Surgical Treatment of Gallbladder Disease. J. F. Erdmann, New York.—p. 429.
Amebic Hepatitis and Hepatic Abscess. A. Ochsner, M. DeBakey, R. Kleinsasser and E. DeBakey, New Orleans.—p. 438.
Liver Dysfunction in Peptic Ulcer. L. M. Morrison, Philadelphia.—p. 448.

Texas State Journal of Medicine, Fort Worth

38:475-528 (Dec.) 1942

Heart Disease in Texas: Public Health Aspects. G. R. Herrmann, G. M. Decherd and A. Ruskin, Galveston.—p. 483.
Endocrine Aspects of Recurrent and Threatening Abortion. E. C. Hamblen, Durham, N. C.—p. 488.
Hypertension, with Special Reference to Role of Kidney. L. G. Rowntree, Washington, D. C.—p. 490.
Injuries to Knee Joint. S. A. Collom Jr., Texarkana.—p. 499.
Multiple Myomectomy. M. W. Sherwood and T. Speed, Temple.—p. 503.
Present Status of Intervertebral Disk Problem. F. K. Bradford, Pensacola, Fla.—p. 507.
Diagnosis and Treatment of Foot Deformities in Children. B. Carrell, Dallas.—p. 509.
*Results of Treatment of Acne Vulgaris by X-Rays and Other Physical Methods. L. M. Smith, El Paso.—p. 512.

Treatment of Acne Vulgaris.—One hundred and thirty of the 169 patients with acne vulgaris that Smith treated with 75 roentgens once a week obtained a final satisfactory result. Also the condition of 23 patients was definitely improved and that of 16 was slightly or not improved. As many factors influence acne vulgaris, attention to them is important in the successful treatment of the disease. Of the several forms of physical therapy used for hastening cure, irradiation is of most value. It is important that sufficient treatment (twelve or more exposures) be given to prevent relapse; overtreatment must be avoided. Roentgen therapy is the least favorable for early cases. Of 100 patients more than 16 years of age, receiving twelve or more treatments of 75 roentgens each, 89 per cent obtained satisfactory results. This percentage could probably be increased if proper cooperation of all patients could be obtained and appropriate follow-up treatment given. Ultraviolet radiation is sometimes of temporary benefit. It is most useful as a desquamating agent between or after courses of roentgen therapy. Mild freezing with carbon dioxide slush is worth trying if roentgen therapy is not advisable, and as a later desquamating agent. Ultraviolet therapy should not be used concurrently with roentgen therapy.

Wisconsin Medical Journal, Madison

41:1067-1166 (Dec.) 1942

Modern Bone Graft Surgery. C. C. Schneider, Milwaukee.—p. 1081.
Wartime Amputations: Value of End Bearing Stumps in Lower Extremity. R. I. Harris, Toronto, Canada.—p. 1086.
Use of Spool Cotton as Suture Material. J. M. King, Milwaukee.—p. 1090.
Ocular Evidence of Head Trauma. F. E. Burch, St. Paul.—p. 1092.
Injuries to Abdominal Wall and Contents. M. A. McGarty, La Crosse.—p. 1097.
Lest We Forget. J. H. Skavlem, Cincinnati.—p. 1100.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Experimental Pathology, London

23:221-276 (Oct.) 1942

Effect of Some Substances Influencing Cell Activity on Growth of Rous No. 1 Sarcoma. J. G. Carr.—p. 221.
Studies on Effect of Carcinogenic Hydrocarbons on Production of Antihormones. C. Hoch-Ligeti.—p. 228.
Production of Hypertension in Rabbits by Intrarenal Injection of Kieselguhr White. B. G. Maegraith and F. J. Maclean.—p. 239.
Electrical Changes in Wounds and Inflamed Tissues: Part I. Bioelectric Potentials of Cutaneous Wounds in Rats. H. Burrows, J. Iball and E. M. F. Roe.—p. 253.
Correlation of In Vitro and In Vivo Drug Action Through Specific Antagonists: Sulfanilamide and *P*-Aminobenzoate. H. McIlwain.—p. 265.
Study of Mitotic Activity of Normal Human Bone Marrow. J. Japa.—p. 272.

British Medical Journal, London

2:597-626 (Nov. 21) 1942

Typhus Group of Fevers: Classification, Laboratory Diagnosis, Prophylactic Inoculation and Specific Serum Treatment. A. Felix.—p. 597.
*Circumcorneal Injection as Sign of Riboflavin Deficiency in Man: Account of Three Cases of Ariboflavinosis. H. Scarborough.—p. 601.
Sulfonamides Used Locally: Their Absorption from Serous Cavities and Wounds in Man. F. Hawking and A. H. Hunt.—p. 604.
Spontaneous Annular Detachment of Cervix During Labor. M. D. Westerman.—p. 606.

Circumcorneal Injection and Ariboflavinosis.—Among 204 persons between 12 and 69 years of age seen in the outpatient department from October 1941 to March 1942, when the nutritional deficiency might be expected to be at its peak, Scarborough observed that 70 had circumcorneal injection. This sign occurred with relatively greater frequency among the older patients; 43 of 63 persons older than 50 were so affected. The observation of Sydenstricker and his co-workers that circumcorneal injection occurs in ariboflavinosis has been confirmed, but a form of the condition exists even in subjects presenting evidence of frank vitamin deficiency disease which cannot be attributed to a deficiency of riboflavin, as it is not cured by the administration of the vitamin. The latter observation no doubt accounts for the relatively high incidence of circumcorneal injection observed. Although circumcorneal injection may be an early stigma of ariboflavinosis it cannot be so considered unless it is supported also by the presence of cheilosis, glossitis, dermatosis and ocular symptoms or by slit lamp examination of the cornea. Certain of the subjects manifest a requirement for riboflavin which, for reasons unknown, is unusually large. Clinically, the circumcorneal injection differs in no material way from that described by Sydenstricker in frank ariboflavinosis.

Lancet, London

2:591-632 (Nov. 21) 1942

Selection of Army Personnel: Development of the Directorate of Selection of Personnel. C. S. Meyers.—p. 591.
*Treatment of Bacillary Dysentery in the Middle East. J. W. Paulley.—p. 592.
Anterior and Posterior Fossa Cerebral Tumors: Clinical Study of 122 Cases. G. J. Dixon and G. FitzGerald.—p. 595.
*Scabies and Intelligence. K. Mellanby, A. L. Northedge and C. G. Johnson.—p. 596.
Diagnosis and Treatment of Sciatic Pain. M. G. Good.—p. 597.

Treatment of Bacillary Dysentery.—At a recent medical conference in the Middle East it was agreed that it is better to do nothing at all for patients with bacillary dysentery than to give them salines which dehydrate an already dehydrated patient. Paulley's results among a large group of patients treated last year on "do nothing, plus fluids" lines were at least as good as those obtained at the same time with patients given saline solution. The tendency of most patients to get better anyway is disturbing, because if the disease is mild (which form has predominated this year) it leads to complacency. The results of five types of treatment are compared: There were no failures among 43 patients treated with sulfapyridine at one hospital and among 30 at another hospital. Of 25 given sulfaguanidine 2 had to be given sulfapyridine and 3 others gave a poor response. The treatment of 60 patients with saline solu-

tion was prolonged (of 1 for sixty-five and of 11 for more than twenty days), but the final result was recovery; in a few severe and chronic infections sulfaguanidine was used. Of 15 treated with koalin 2 required sulfapyridine. The average time in bed for the five groups of patients was approximately four and a fourth, five, five and a third, twelve and a half and six days. In the treatment of an isolated and severe epidemic of Shiga dysentery in one camp both sulfapyridine and sulfaguanidine were efficacious, but the period of therapy was generally longer than it was for the bacillary dysentery. As there were no cases of dysentery in this or an adjacent camp for three months, the cause of the outbreak was possibly a carrier in a draft of 70 men who had arrived from India about seven days before the dysentery began. The number of stools was reduced and the blood and mucus in them disappeared more rapidly among patients treated with sulfapyridine than among those on sulfaguanidine. Also patients on sulfapyridine became apyrexial within twenty-four hours as compared to four or five days for sulfaguanidine. Sulfonamide treatment brings about a rapid recovery, solid food can be taken early, convalescence is short and discomfort is quickly curtailed. The disadvantage is crystallization in the renal tubules with anuria. In the Middle East supply and cost must also be considered, but from the military and civil aspect this is outweighed by the shortened period of noneffectiveness. Treatment should be begun before the disease has spread or become chronic.

Scabies and Intelligence.—Mellanby and his co-workers assessed the intelligence of several hundred patients with scabies. The results indicated that the men with scabies were mentally an approximately normal sample from the army. There was nothing to suggest that the group contained an abnormally high proportion of men of low grade intelligence. There was no significant difference in intelligence between men who reported themselves sick, those who were detected at routine inspections, those with few or with many parasites or those with or without secondary infection.

Medical Journal of Australia, Sydney

2:371-392 (Oct. 24) 1942

*Investigations of Influenza Epidemic in Military Camps in Victoria, May 1942. F. M. Burnet, W. I. B. Beveridge, Diana R. Bull and Ellen Clark.—p. 371.
Some Surgical Experience in the Middle East. N. Robinson.—p. 376.

2:393-412 (Oct. 31) 1942

Suggestions Critical of and Alternative to Outline of a Possible Salaried Medical Service, as Set Out in the Report of the National Health and Medical Research Council, 1942. A. E. Brown.—p. 393.
Photoretinitis in Antiaircraft Lookouts. J. Flynn.—p. 400.

2:413-432 (Nov. 7) 1942

Infectious Mononucleosis: Problem in Diagnosis. T. E. Hester Spark.—p. 413.

Influenza Epidemic in Military Camps in Victoria.—Typical virus influenza occurred in Victoria and in the military camps near Melbourne in May 1942. Burnet and his co-workers tried to establish whether this epidemic was true virus influenza and, if so, to determine the type of virus. Virus was readily isolated by the amniotic method and produced decided temperature responses in ferrets. Patients with typical symptoms showed a sharp rise in antibody in the fortnight following the illness. The only anomalous feature was the season at which the epidemic appeared. Unusually cold wet weather in addition to camp conditions may have been wholly or partly responsible for this change. Serologic studies only confirmed the relatively homogeneous character of the epidemic; in only 1 subject with typical symptoms was the rise insignificant. Comparison with an unselected camp population confirms the general finding that susceptibility to influenza is significantly correlated with an initially low antibody level; however, a relatively high antibody level is no guaranty of immunity. It is the authors' impression that nonspecific inhibition by serum protein plays an important part in determining the initial titer of a given subject and that specific antibody inhibition is superimposed on this nonspecific effect. This aspect must be clarified before the significance of detailed serologic studies on specimens of serum by Hirst's method can be discussed or determined.

Annales Pædiatrici, Basel

159:1-56 (July) 1942. **Partial Index**

*Clinical Picture of Interstitial Plasma Cell Pneumonia in Infants. E. Hug.—p. 2.
Relation Between Enuresis and Epileptic Crises in Children. M. Schachter.—p. 19.
Nutritional, Metabolic and Digestive Disturbances in Children with Malaria. A. Eckstein.—p. 25.

Interstitial Plasma Cell Pneumonia in Infants.—Hug believes that plasma cell pneumonia is a distinct entity. He reviews histories of 8 instances observed in his clinic, all of them in premature infants. Four of these died and were subjected to a necropsy. The author suggests that this type of pneumonia is probably not caused by infection but is due to improper method of nursing. The condition develops as a result of repeated aspirations of small amounts of food because of careless feeding technic of premature infants who are difficult to feed. This opinion is supported by the postmortem status described by Roulet, who found that the microscopic picture of this type of pneumonia greatly resembles that of aspiration pneumonia. He believes that the increase in the interstitial tissue and its dense infiltration with plasma cells are manifestations of a reaction on part of the lung to a substance consisting, as milk does, chiefly of protein and fat. The close relationship of plasma cells to protein decomposition is well known.

Archivos Americanos de Medicina, Buenos Aires

18:64-81 (Oct. 1) 1942. **Partial Index**

Traumatic Luxation of Hip in Children. L. Velasco Blanco and E. M. Echegaray.—p. 64.
Sulfonamide Therapy in Ophthalmologic Disorders in Childhood. B. V. Ré.—p. 71.
*Case of Fatal Intoxication by Sulfanilamide and Sodium Sulfate. A. F. Parodi and T. R. Foa.—p. 75.

Fatal Intoxication by Sulfanilamide and Sodium Sulfate.—Parodi and Foa's patient was a woman aged 31 who complained of malaise, coryza, sore throat and cough. A physician diagnosed her disorder as influenza and prescribed sulfanilamide, of which she took 2 Gm. on the day of the consultation. In the evening of the same day the woman took a purgative dose of sodium sulfate. On the following morning she exhibited severe dyspnea, cyanosis and stupor. Oliguria had existed since the night before. She was hospitalized at 11:30 a. m. in a comatose condition and died at 4:30 p. m. The circulatory, respiratory and hematologic symptoms were the result of a severe anoxemia caused by the combination of sulfanilamide with sodium sulfate, which led to the formation of sulfmethemoglobin. Paton and Eaton reported in 1937 that the simultaneous administration of azosulfamide and the sulfates of sodium or magnesium and purgatives produce grave intoxications. According to Parodi and Foa the therapeutic procedures recommended include intravenous injection of methylene blue, oxygen therapy and blood transfusion. In their case death ensued before a transfusion could be carried out. Chilean authors did not see any advantage from the use of nicotinic acid as recommended by Ginty. The authors stress that sulfanilamide is incompatible with a number of other drugs, such as gold, arsenic, bismuth, sulfur compounds, particularly purgatives, antipyrine and aminopyrine. Alcohol should be abstained from during the use of sulfanilamide in order to avoid cerebral symptoms. Hepatic and renal functions should be determined before and during this medication. The blood is to be watched for the appearance of anemia or agranulocytosis, and the blood and urine concentration of the drug should be determined.

Boletín Clínico, Medellín

8:57-108 (March-April) 1942. **Partial Index**

Remarks Regarding Functional Pathology. J. M. Restrepo.—p. 57.
Etiopathogenesis and Treatment of Gastroduodenal Ulcer. R. Uribe Vélez.—p. 78.
*False Jaundice: Cutaneous Xanthochromia Caused by Hypercarotenemia. J. Yepes Cadavid.—p. 103.
Chronic Appendicitis and Benign Traumatic Diverticulitis. C. García Mayorca.—p. 105.

False Jaundice.—According to Yepes Cadavid, cutaneous xanthochromia results from abuse of a vegetarian diet sometimes employed to obtain a laxative action. Excessive intake of foods such as carrots, green vegetables, papaya and sapodilla causes an overflow of the hepatic carotene storage and this

results in a pseudoicteric appearance of the skin. This pigmentation frequently remains localized on the palms of the hands and feet but may involve all of the skin. The author cites 2 women, aged 48 and 18, who had eaten excessive quantities of papaya to relieve constipation. Both patients developed a generalized pigmentation, but their conjunctivas were clear and the urine was free from biliary pigments. The coloration was of an orange or saffron shade and was especially evident over the neck. Mild xanthochromia was present in the sublingual mucosa. The causal agent of this disorder is the yellow coloring matter carotene, of which certain plants contain abundant amounts. The liver transforms this provitamin into vitamin A by means of a ferment. Large amounts of carotene in the food exceed the capacity of the liver to utilize it, and hypercarotenemia results. Hypercarotenemia may develop in the absence of alimentary excess of carotene as a result of hepatic insufficiency which impairs the metabolism of this pigment. Carotene exists in the blood from birth in quantities that increase somewhat with age. Under normal conditions the carotene content varies between 0.3 and 0.7 mg. per liter. In patients with xanthochromia it reaches up to 3 mg. per liter. Cutaneous xanthochromia of hypercarotenemia is a benign transitory disorder which improves with the suppression or limitation of carotenophorus foods and the stimulation of liver by injectable liver extracts.

Revista Clínica de S. Paulo, São Paulo

12:1-30 (July) 1942. **Partial Index**

*Aneurysm of Peripheral Arteries in Course of Subacute Bacterial Endocarditis. M. R. Castex, E. S. Mazzei and A. Lavarello.—p. 1.
Physiopathology of Yellow Body. F. Bergamin.—p. 8.

Aneurysm of Peripheral Arteries.—Castex and his collaborators report 2 cases of aneurysm of peripheral arteries in the course of a subacute bacterial endocarditis. The incidence of aneurysm in subacute bacterial endocarditis is greater in patients of the ages between 20 and 40 than in the young and the old. It involves peripheral arteries as a rule. It may be multiple and may appear in one or all of the extremities. Streptococcus viridans alone or with other bacteria is the organism more frequently identified in the walls of the aneurysm. The aneurysm appears suddenly and is usually very painful. True subacute peripheral aneurysm of endocarditis is circumscribed and limited. Frequently it ruptures spontaneously and produces either a diffuse or a false aneurysm. A large hematoma about the ruptured aneurysm is the most obvious anatomic sign of a false aneurysm. The microscopic changes are variable. They may show local inflammation, endothelial obliteration of the vasa vasorum and ischemic necrosis of the arterial wall or blood infiltration of the arterial walls, which is an equivalent of a local suppuration. Peripheral arterial aneurysm is of diagnostic value in recognition of a subacute bacterial endocarditis. The fatal course of endocarditis is not the result of the aneurysm. The treatment of the aneurysm consists of a compressing bandage to control the pain. The surgical treatment consists of ligation of the artery or of extirpation of the aneurysmal segment. It is indicated in cases of intractable pain and threatened rupture.

Revista Clínica Española, Madrid

6:1-64 (July 15) 1942. **Partial Index**

Anomalies of Pigmentation. L. Mompó Aliño.—p. 1.
*Glomus Tumors. A. Ley and R. Roca de Viñals.—p. 7.
Fractures of Upper End of Radius. L. Sierra Cano and F. López Areal.—p. 12.
Pathogenesis, Symptomatology and Treatment of Mongoloid Oligophrenia. J. de Moragas.—p. 20.
Glomus Tumor with Microscopic Aspects of Glomangioma. M. D. Adame y Romero.—p. 35.
*Adamantinoma of Nose. P. de Juan and E. Oliva.—p. 37.
Intestinal Obstruction Caused by Cicatricial Stenosis: Sequela of Strangulated Femoral Hernia. F. Loscertales.—p. 42.
Treatment of Myocardial Infarct of Coronary Insufficiency. J. López Brenes.—p. 44.

Glomus Tumors.—Ley and Roca de Viñals describe 2 cases of glomus tumor. The first patient, a man aged 50, had a small nodule on the outer aspect of the forearm. The nodule grew slowly. In the last months it had caused extremely painful crises. The pain radiated into the arm and the shoulder and at times involved the whole left side of the body, producing a sort of hemiparesis which persisted for several seconds. The nodule, the size of a grain of rice, was adherent to the skin. It was diagnosed as glomus tumor and was removed. The pain ceased after extirpation and did not recur. The second patient was a girl aged 18. The condition was atypical in symptoms and localization. This patient complained of paroxysmal pains in the right hand. For several months previous to her seeking medical aid the pain had become more severe with greatest intensity in the ring finger. The pain was accompanied by tumefaction, cyanosis and loss of power. Neurologic examination revealed the syndrome of Claude Bernard-Horner. On the basis of a tentative diagnosis of polyarthritis of the chronic inflammatory type, combined administration of salicylate and sulfanilamides was tried, but without effect. Fever therapy likewise failed. Roentgenograms of the hand revealed a cystic formation in the first phalanx of the right ring finger. On removal the growth appeared as a round, bluish red tumor measuring about 9 mm. It was lodged almost completely in the bone. It was designated as a glomus tumor on the basis of microscopic examination. The pain ceased immediately after the operation and did not recur. Intraosseous location of a glomus tumor is exceptional. Association with the Bernard-Horner syndrome is interesting. It was reported by Barre in a case of subungual glomus tumor. It is suggested that the syndrome is due to abnormal stimulus resulting from hyperplasia of the peripheral neuromyoarterial organ provoking by reflex action inhibition of the cervical sympathetic, this in turn confirming the importance of the role of the "cutaneous glomus" in the regulation of the peripheral circulation.

Adamantinoma of Nose.—According to de Juan and Oliva, adamantinomas which originate from the epithelial remains of the enamel organ usually develop in the maxilla, particularly the lower one. Literature contains reports of other localizations of this type of tumor, such as tibia, sella turcica, hypophysis, sphenoid, ovary, pharynx and parotid. There appears to be no record of an adamantinoma located on the tip of the nose. The authors' patient was a woman aged 81, who developed an adamantinoma of the tip of the nose, which rapidly grew from the size of a grain to that of a hazelnut. The growth was excised at its pedicle, and the resulting wound cicatrized completely in the course of eight days.

Semana Médica, Buenos Aires

49:881-940 (Oct. 15) 1942. **Partial Index**

Clinical Aspects of Venous Pulse. T. Padilla—p. 881.
*Syndrome of Ehlers-Danlos. A. Roca, G. J. Loiácono and E. Mundet.—p. 887.
Chronic Intestinal Invagination by Lymphoma of Terminal Portion of Ileum: Cure by Operation of Barker. A. Casaubon, M. C. Rocca and F. M. Trostbach.—p. 894.
Preparation of Convalescent Serums. J. Morán.—p. 898.
Obsessive Syndrome and Rabies. J. F. Capelli.—p. 906.
Surgical Hydrocele. J. Irazu.—p. 911.
Unilateral Absence of Uterine Adnexa. D. Berdeal Avila.—p. 915.
*Cure of Wounds with Glass Dressings. F. P. Giordano.—p. 928.

Syndrome of Ehlers-Danlos.—Roca and his associates report 2 cases of Ehlers-Danlos syndrome in two brothers aged 26 and 23 respectively. The disorder is a rare dystrophy, frequently congenital and hereditary and almost always familial, which involves mesenchymal tissues and is characterized by abnormal elasticity and vulnerability of the skin, articular looseness and formation of cicatrized molluscoid pseudotumors. It was described in 1890 by Ehlers, while Danlos added to its knowledge in 1908. It may appear in either sex but seems to have a predilection for the male. The prominent symptoms are hyperelasticity of the skin, articular looseness, molluscoid tumors resulting from the abnormal vulnerability of the skin and a tendency to hemorrhages. In the 2 cases photographs demonstrate the great elasticity of the skin, particularly in the region of the elbow. Biopsy specimens of the skin in this region disclosed an abundance of elastic fibers and of collagenous tissue, and lymphoplasmocytic infiltration particularly at the papillary

and deep boundaries of the dermis and around the vessels. The syndrome is to be differentiated from cutis laxa, chronic atrophic dermatitis, elastic pseudoxanthoma, juvenile xanthoma, Recklinghausen's disease, chronic atrophic dermatitis of Pick-Hersheimer and geromorphism of Souanet and Charcot. The syndrome persists throughout life, but the hyperelasticity of the skin and joints tends to decrease in the course of years.

Cure of Wounds with Glass Dressings.—Giordano experimented with glass dressings intended to put the wound at rest and to permit of a continuous supervision of the healing process. The glass dressings are concave plates applied over the wound and fastened with adhesive strips. The dressings have small openings on the sides for ventilation. They represent a saving in material and diminution of pain for the patient. The dressings are advantageous in postoperative wounds and particularly in wounds that heal by secondary intention.

Klinicheskaya Meditsina, Moscow

19:1-96 (No. 9) 1941

Role of Internist in Military Medicine. E. I. Smirnov.—p. 3.
Attacks of Accelerated Cardiac Activity and Their Clinical Significance. A. M. Sigal.—p. 11.
*New Methods in Surgical Therapy of Cardiac Ischemia. B. P. Kirillov.—p. 40.
*Dynamic Changes of Electrocardiogram After Heart Wounds. D. F. Presnyakov.—p. 51.
*Cure of Agranulocytosis by Transfusion of Blood from Leukemic Patient. I. M. Rybakov.—p. 70.

Surgical Therapy of Cardiac Ischemia.—Kirillov maintains that an artificial collateral blood supply may be provided for the heart and that it develops especially well in those cases in which there is a physiologic need; that is, in cases of impaired cardiac circulation. After creation of a collateral blood supply the ligation of the coronary arteries does not interfere with cardiac function of experimental animals. While other tissues, such as the large pectoral muscle and the lung, have been used as sources of collateral circulation, Kirillov considers the omentum most satisfactory for this purpose. Anastomoses between the heart and omentum develop within two to three weeks and are not obliterated later (as demonstrated in experiments prolonged for more than a year). The newly formed anastomoses appear in the form of fine capillaries uniting the arterial network of the omentum with the vascular system of the heart. It is not necessary to suture the omentum to the heart. After preliminary scarification of the epicardium the omental tissue is brought into close proximity to it. If the epicardium is left intact the adhesions which develop may not extend along the entire surface of contact between the omentum and the heart. In addition to serving as a source of collateral blood supply the omental tissue may serve as an anastomotic bridge across which the blood can flow from the normal part of the heart to the part with impaired circulation. The simplicity of the author's technic guarantees a low postoperative mortality. Instead of the transdiaphragmatic route used by O'Shaughnessy, Kirillov pulls the omentum through a subcutaneous tunnel above the ribs. In man this operation can be performed without opening the pleura. The time required is no more than twenty-five to thirty minutes. While at present artificial vascularization of the heart is largely confined to experimental animals, Kirillov believes that it will soon become an accepted procedure in surgical practice.

Electrocardiogram in Heart Wounds.—Presnyakov presents a table summarizing the electrocardiographic findings in various types of heart wound as recorded in the literature. He reports a case of knife wound of the right ventricle in which an electrocardiogram was obtained soon after the injury and was repeated daily for a long period. The most pronounced characteristic was a considerable displacement of the ST segment. With a few exceptions the electrocardiographic changes resembled those observed in myocardial infarction of the anterior wall. The author attributes these differences from the typical electrocardiogram of infarction to the fact that in this case the large branches of the coronary vessels were not involved in the injury. Electrocardiography in cases of heart wounds is a valuable aid in diagnosis and localization. It may also facilitate topical diagnosis of myocardial lesions in various diseases, especially in infarction.

Transfusion of Leukemic Blood in Agranulocytosis.—Rybakov reports the case of a 36 year old man who was admitted to the hospital with symptoms of extreme weakness, sore throat and fever. Because of a history of malaria and the presence of malarial parasites in the blood, tropical malaria was at first considered as a diagnostic possibility. But the granulocytopenia (93 per cent) and necrotic foci in the oral cavity led to the recognition of a disease of the agranulocytic type possibly exacerbated by malaria. Transfusion of leukemic blood was decided on and antimalarial therapy was postponed. A patient with chronic myeloid leukemia in a state of remission after roentgenotherapy was selected as donor. His leukocytic count was about 30,000, with 25 per cent embryonic forms. He was of the same blood group as the patient with agranulocytosis. Within four days after the transfusion, the blood picture had gradually returned to normal with an increased number of leukocytes and 58 per cent of neutrophils. The temperature remained normal from the third day on. Within five or six days the necrotic foci in the oral cavity were covered with healthy granulation tissue, the mucous membranes resumed their normal color and the bad odor and profuse salivation disappeared. After a course of antimalarial therapy the patient was discharged fully recovered.

Voprosy Neyrokhirurgii, Moscow

6:1-90 (Nos. 1-2) 1942. **Partial Index**

Certain Peculiarities of Craniocerebral Gunshot Wounds in Present War as Observed in Hospital Practice. V. A. Gusynin.—p. 5.
Late Primary and Secondary Treatment of Craniocerebral Wounds. A. Arendt.—p. 11.
*Papilledema in Craniocerebral Gunshot Wounds. A. N. Murzin.—p. 47.
*Role of Histamine in Therapy of Various Forms of Pain Associated with Gunshot Wounds of the Peripheral Nervous System. I. I. Rusetskiy.—p. 70.

Papilledema in Craniocerebral Gunshot Wounds.—Murzin observed edema of the optic disk in 60 per cent of all cases of craniocerebral wounds. This symptom is significant in diagnosis, since it indicates a progressive intracranial hypertension possibly requiring immediate surgical intervention. Infection of the wound or an infectious process developing as a result of foreign bodies (metal or bone fragments) in the brain are the chief causes of papilledema. Gunshot wounds of the parietal and occipital region are more frequently associated with choked disk than are injuries of the frontal lobe. Since papilledema rarely occurs in cranial wounds without penetration of the dura, it may aid in differential diagnosis of the type of wound. Murzin suggests that the term "edema of the optic nerve" be used in cases in which it is difficult to differentiate between congestive and inflammatory manifestations.

Histamine for Pain from Gunshot Wounds of Peripheral Nerves.—Rusetskiy injected intracutaneously 2 to 3 drops of a 1:1,000 solution of histamine hydrochloride in 60 cases of peripheral nerve injuries associated with painful syndromes. In the majority of cases there was a temporary analgesic effect lasting from three to six hours. Preservation of some degree of sensitivity in the area of injection was a prerequisite for this therapeutic action. Histamine injections at a distance from the painful zones had no effect. When the injections were repeated at frequent intervals the analgesic effect became weaker and of shorter duration. Less concentrated solutions of histamine proved ineffective. In pain syndromes associated with vascular spasm, histamine injections not only relieved the pain but produced a prolonged dilatation of the cutaneous capillaries of the painful zone. The mechanism of the analgesic action of histamine is dependent on neurohumoral reactions developing in the organism. There is no inhibition or weakening of sense perceptions. The painful area of the skin responds to sensory stimuli in the same way as before the injection. Rusetskiy emphasizes the need of further research on the problem of relief of pain connected with peripheral nerve injuries, in view of the frequency of this type of injury in war.

Book Notices

War Gases: Their Identification and Decontamination. By Morris B. Jacobs, Ph.D. Cloth. Price, $3. Pp. 180, with 8 illustrations. New York: Interscience Publishers, Inc., 1942.

In the event of a poison gas attack on civilians, vigorous preventive action by local defense authorities must be taken. Although those already gassed will be cared for by physicians, the gas identification officer, the decontamination officer and the health officer must speedily identify the chemicals involved, mark off contaminated areas and issue such information as will prevent further casualties from occurring, allay fear and in general guide medical treatment. Dr. Jacobs has prepared the present volume to provide these officers with "a system for the detection, the sampling and the identification of the chemical warfare agents, and the decontamination of areas and materials polluted by them." This highly technical material is presented in short textbook form accurately and concisely yet with much valuable factual information. The inclusion of numerous tables, diagrams and references is helpful. Although the book is not intended primarily for the physician, it contains many data on the toxicity and fundamental chemical reactions of the war gases that will be useful to him.

Growing Up in a World at War. Paper. No pagination. Chicago: Institute for Psycl oanalysis, 1942.

This pamphlet is a report of a group of child psychiatrists and psychoanalysts, members of a committee on psychologic problems of children in wartime. The purpose was to present an analysis of the probable important effects of the war on children and the effect on their character development. Children's reactions to any fearful situation are dependent on their earlier life experiences and the emotional stability of the parents. The reaction to war may mean for the child insecurity based on reopening of old anxiety or on change in the child's environment or may be dependent on transmission to the child of the parents' feelings of insecurity.

The children observed showed defenses against the anxiety provoked by the war characteristic of the age and personality makeup of each child. These defenses, such as talking about the war, bragging, depreciation of the enemy and denial of danger, are discussed. Some of these are recognized to be wholesome defenses and some potentially harmful to the child's growth. Children of preschool age up to 5 or 6 years are particularly sensitive to the attitudes and feelings of those about them. While fears for these children center primarily about fear of separation from their parents, they are reinforced by specific anxiety producing situations they have already experienced. The unknown is terrifying for children, and much anxiety is occasioned in this youngest group by their lack of understanding of the situations they have discussed.

The grade school children seem somewhat less vulnerable than the younger children. While faced with the same basic anxieties as are found in little children, they are preoccupied with achievement in academic and physical skills and tend to visualize dangers in more explicit terms than do the younger children. They are curious about the war but feel emotionally somewhat detached from the war threat unless separation from the parents or parental anxieties obtrude. Children of this age are particularly eager to participate in activity of aid in the war.

For the adolescent, wartime conditions are particularly disturbing. For him the insecurity present in children of all ages takes the form of anxiety for his future, his schooling, his career. Natural resistance to authority evidenced by adolescents is greatly accentuated. Interruption of schooling and opportunity for employment disrupt the peacetime controls. The greatest danger to the adolescent, as has been true in England, is delinquency. This is not a wartime problem primarily, but for adolescents the shift of peacetime values to the permissiveness of wartime creates a new burden under which it is more difficult to maintain equilibrium.

This pamphlet is directed to teachers, social workers and group leaders as well as to parents. The planning suggested is based on an interest to avert development of neurotic reactions, character breakdown and delinquency.

The Aromatic Amino and Nitro Compounds, Their Toxicity and Potential Dangers: A Review of the Literature. By W. F. von Oettingen, Principal Industrial Toxicologist, U. S. Public Health Service. From the Division of Industrial Hygiene, National Institute of Health. Prepared by direction of the Surgeon General. Federal Security Agency, U. S. Public Health Service. Public Health Bulletin No. 271. Paper. Price, 25 cents. Pp. 221, with 5 illustrations. Washington, D. C.: Supt. of Doc., Government Printing Office, 1941.

The extraordinary development of war industries in recent months has brought into sharp focus the need for detailed knowledge of the toxicology of the manifold chemical compounds used in present day manufacturing. In the present emergency many materials are being used both as solvents and as starting materials for chemical synthesis which have not been carefully scrutinized for possible deleterious action on workers. The hazard involved in the use of these compounds is enhanced by the pressure for production, which tends to minimize the use of peacetime precautions in the now crowded plants. Furthermore, certain solvents, degreasers and chemical reagents which had been restricted in use because of proved toxicity have appeared again because appropriate substitutes are not available in quantity.

Under these circumstances the present compilation of data on the aromatic amino and nitro compounds is peculiarly welcome. Published as a public health bulletin, this summary embodies a wide range of facts. In many cases the chemical formulas, solubilities and chemical properties of the series of compounds under discussion are given, with a synopsis of the method of manufacture and the industrial processes for which they are employed. Methods of detection and analysis are given. The effects on animals are cited, with reference to the literature, from which toxic doses or lethal concentrations of vapor are tabulated. The symptoms and signs of poisoning in man are discussed, and in some instances appropriate treatment is outlined.

Among the aromatic amino compounds included are alkyl and aryl substituted derivatives of aniline, e. g. methylaniline; acetanilid and its derivatives; halogen and nitrated aniline compounds; paraphenylenediamine, and other derivatives of benzene or phenylenediamine. The large group of toluene, xylene and phenolic compounds follows. Next nitrobenzene, chlorinated nitrobenzene, nitrated toluene (e. g. trinitrotoluene), nitrated xylene and nitrated phenols are discussed. Of special interest are the sections on trinitrophenol (picric acid) and on phenylhydrazine. Finally various naphthalene compounds are considered, such as diamino derivatives of naphthol.

There are frequent tables and several good graphs showing comparative toxicity at various dosage and concentrations. There is a bibliography of nearly seven hundred references filling some twenty-nine additional pages.

This compact and concentrated compendium will prove invaluable to safety committees in large plants and to industrial physicians. It should be on hand in every state health laboratory and similar municipal institutions or offices of insurance appraisers. In medical schools, particularly in relation to courses on public health and industrial medicine, the bulletin will be especially welcome.

Surgical Pathology. By William Boyd, M.D., LL.D., M.R.C.P., Professor of Pathology, University of Toronto, Toronto. Fifth edition. Cloth. Price, $10. Pp. 843, with 520 illustrations. Philadelphia & London: W. B. Saunders Company, 1942.

This edition contains many improvements in text and illustrations over the previous one. Numerous new subjects have been added. The author appropriately devotes chapter 1 to a discussion of the importance of pathology to surgery. He calls attention to the fact that the material seen in the necropsy room is far different from the pathologic material seen in the operating room, since the former represents disease in its late stages whereas the early stages of disease are observed in the operating room. The author therefore correctly implies that surgical pathology is different from pathology but emphasizes that the surgeon or surgical pathologist must first be grounded in the science of pathology. The text reads smoothly; it is readily understandable and is devoid of complicated terms and classifications. For that reason the volume is appropriate for students' use. The early chapters particularly are examples of this simplicity and freedom from complicated discussion.

Although the text, in general, is an expression of the author's experiences and opinions, he has not failed to include the opinions of others; thereby he has been able to keep his material up to date. For example, in cholecystitis he correctly considers bacterial inflammation of secondary importance to chemical inflammation, which he believes is the instigating lesion in gallbladder disease. Moreover, Batson's theory of the spread of carcinoma is given credence and Langley's theory criticized as being wholly inadequate. Strictures of the rectum are correctly ascribed to venereal lymphogranuloma and not to syphilis.

Naturally the description of certain lesions is not as concise and accurate as the description of others. For example, the author's use of various terms in the discussion of certain types of goiter is disappointing. Although he occasionally uses some of the terms adopted by the American Association for the Study of Goiter many years ago, he fails to adhere to that classification, which describes the different types of goiter adequately. Many surgeons indeed would take exception to his statement on page 311 that local excision of malignant polyps of the rectum is sufficient. Although there is a total lack of agreement among surgical pathologists as to the classification to be used for chronic cystic mastitis, the reviewer has encountered many descriptions and classifications which might be considered more expressive of the various lesions found in that disease. However, the inadequacies in this textbook are so infrequent that they are overshadowed by the fine points. It may correctly be considered an authoritative treatise on surgical pathology and is particularly adapted for use by the student.

Medical Manual of Chemical Warfare [Including also] An Atlas of Gas Poisoning. Reprinted by Permission of the Controller of His Britannic Majesty's Stationery Office. Revised edition. Cloth. Price, $2.50. Pp. 106, with 5 illustrations; 15, with 10 illustrations. Brooklyn: Chemical Publishing Company, Inc., 1942.

This manual is a British official release on the first aid procedures for and later treatment of war gas casualties. Its value is much enhanced by the inclusion in color of plates from "An Atlas of Gas Poisoning, London, 1918 and 1937," illustrating typical "blue" and "gray" cases of suffocant gassing and classic vesicant lesions of the skin and eye. The text is unusually complete for a manual, yet the work has lost none of its force, the result chiefly of accurate writing, emphasis on essentials and large print. It must be remembered that knowledge of the treatment of war gas casualties, like the knowledge of the treatment of other injuries, is not static. Thus any manual tends to become out of date. The British have attempted to remedy this by issuing amendments from time to time. The usefulness of the manual is impaired unless these are at hand for reference. British thought has had considerably longer than has ours to crystallize on matters of chemical warfare defense, and this is reflected in this manual. It is heartily recommended. The first American edition of "Medical Manual of Chemical Warfare," published by the same company in 1941, is much handicapped by its less attractive print, black and white illustrations and high retail price.

Developmental Aphasia in Educationally Retarded Children: An Examination of the Thesis that the Core of Backwardness in the Primary School, in so far as This is not due to low Mental Capacity, is Provided by Aphasic Characters of Learning Interference. By M. MacMeeken, M.A., B.Ed., Ph.D., Department of Psychology, Edinburgh University, Edinburgh. Publications of the W. H. Ross Foundation (Scotland) for the Study of Prevention of Blindness, II. Paper. Price, 3s. Pp. 95, with 46 illustrations. London: University of London Press, Ltd., 1942.

The author has produced an excellent summary on developmental aphasia, a term covering the various types of psychologic disorders which are commonly known as word blindness, word deafness, speech disorders, speech delay and apraxia. He analyzes the syndrome in considerable detail and studies a group of 140 retarded children by means of the Terman-Merrill revision of the Stanford-Binet scale and a number of tests of language attainment, as well as tests of laterality and squint. The author devotes many pages to graphs, tables and charts showing psychologic characteristics such as reading and spelling accomplishments, relationship of retardation to learning interference and eye dominance as related to learning interference of both a qualitative and a quantitative nature. The author's conclusion is that the problem of retardation in children due to interference in language learning has a high relationship with left laterality of the eye and some relationship to left-handedness and squint according to either left or right eye dominance. A good deal of learning interference, he says, is not due to "lack of capacity" but is related to a "functional, confusional pattern." His data would seem to bear out this conclusion fairly competently.

Memoranda on Medical Diseases in Tropical and Sub-Tropical Areas. Reprinted by Permission of the Controller of His Britannic Majesty's Stationery Office. By Command of the Army Council, Great Britain War Office. First American edition. Cloth. Price, $4.75. Pp. 282, with 108 illustrations. Brooklyn: Chemical Publishing Company, Inc., 1942.

This is a military manual of essential material needed during special emergencies. Its table of contents includes most acute diseases which are or may be of importance in hot climates, including smallpox, trench fever and typhus fever. It is an excellent practical summary of great value for physicians facing unfamiliar disease problems in warm climates. It is especially strong on control methods. It will be of limited value for American civilian and military physicians. More in detail, the chapter on malaria is a condensed manual of much value. Pellagra is not discussed. There is a tendency to present outmoded and alternative theories which might well be expurgated. Based on British army experience, the discussions are not adequate in many fields where American work is preeminent, as in the food deficiency diseases, typhus group and amebiasis. In the case of amebiasis, for instance, too many drugs are recommended on the basis of authority and custom rather than on the basis of objective experience and scientific evaluation of their toxicity and action. Probably the most important diseases from a military standpoint in the field are malaria, dysentery and typhus fever. A broader as well as more specific discussion of the last mentioned would be an improvement. Malaria and dysentery are well covered. The illustrations are excellent, as is also the selection of temperature charts and the comprehensive index. The statement under dysentery could well be extended to civil practice: "Any medical officer not submitting the stools of his dysentery patients for laboratory examination, where facilities for such exist, is guilty of criminal negligence." The small but legible type allows a surprising amount of material to be presented.

Homenaje al Profesor Pedro Belou de sus ex-colaboradores y miembros del personal docente y tecnico del Instituto de anatomia y 1.ª Cátedra de anatomia descriptiva de la Facultad de ciencias médicas de Buenos Aires en el 28.° año de su ejercicio docente en la Cátedra Universitaria. Paper. Pp. 467, with illustrations. Buenos Aires: Guillermo Kraft Ltda., 1941.

This book was prepared in homage to Dr. Pedro Belou by his collaborators and the group of technicians and instructors of the Institute of Anatomy and the first chair of descriptive anatomy of the Faculty of Medical Sciences of the University of Buenos Aires. It was presented to Dr. Belou on the twenty-eighth anniversary of his teaching in the chair of anatomy of the faculty. The book contains several articles of Dr. Belou which were read before medical societies and have not been previously published. It contains also news items in several medical journals of our hemisphere and of Europe concerning lectures, trips and some other medical activities of Dr. Belou, as well as reproductions of speeches in his honor. There are several pictures of Dr. Belou from childhood to his present age, pictures of scenes during ceremonies in his honor and of honorary diplomas given to him in various countries. There is a large section of bibliography of Dr. Belou's work. The larger part of the book is dedicated to the morphology of the arterial system, to which subject Dr. Belou has devoted a large part of his activities.

Recent Advances in Pathology. By Geoffrey Hadfield, M.D., F.R.C.P., Professor of Pathology in the University of London, and Lawrence P. Garrod, M.A., M.D., B.Ch., Professor of Bacteriology in the University of London. Fourth edition. Cloth. Price, $5.50. Pp. 346, with 35 illustrations. Philadelphia: Blakiston Company, 1942.

The advancement of our knowledge of disease and its effects on the human body has made necessary discussions of the vitamin deficiency diseases, essential hypertension and some of the problems related to war, such as the crush syndrome. So rapid, however, has been the progress of problems related to the war that one finds no discussion whatever of blast. There are accounts of new investigations in the field of cancer research, rheumatic fever and pneumonia.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

COLD ALLERGY WITH NASAL SYMPTOMS

To the Editor:—**What can be done for a woman aged 38 with a "cold and moisture allergy" whose general physical and head examinations are entirely negative? On exposure to cold moist air she immediately develops a congestion of the nasal membranes—probably due more to moisture than to cold, as dry frosty weather does not bother her much. Physical examinations, roentgenograms and nasal examination in warm dry weather are entirely negative. There are no protein allergies and there is no family history of any. The tonsils are out. Nasal lavage and mild protein silver packs do not help in the least. Nothing in her surroundings appears to contribute to her condition.**

M.D., Pennsylvania.

ANSWER.—It is questionable whether there is any difference between allergic nasal responses to cold air or to cool humid air: both are undoubtedly instances of cold allergy. Any one of several measures may prove successful in the management of this condition. Daily cold showers, followed by warm if the reaction is too severe, may create a tolerance. Tub baths, the temperature of which is reduced daily, may also be effective. Some clinicians have employed ice rubs to the chest, followed by heat application if necessary. The latter form of treatment may be rather hazardous. A simple method for increasing tolerance to cold consists in immersion of both hands and forearms in cold water (about 45 F.) for about four minutes twice daily. In some instances injections of histamine have been of considerable help in relieving the condition. They should be given twice daily at first, beginning with a dose of about 0.1 cc. of a 1 to 5,000 solution and increasing it until a maximum dose of about 0.2 to 0.3 cc. of the 1 to 1,000 solution is reached. After about a two week schedule of bidaily doses the injections may be given daily and finally twice weekly.

DISEASES FROM DOGS AND CATS

To the Editor:—**Recently I have been asked by several persons about the advisability of having cats and dogs as pets in a household where there are babies and younger children. Could you give me any references on the subject and perhaps a list of diseases that are carried by dogs and cats?**

H. R. Fishback Jr., M.D., Albuquerque, N. M.

ANSWER.—Rabies is the most serious of the afflictions which can be charged against the dog. Leptospirosis is becoming an increasing problem in dogs, with human infections by both Leptospira icterohemorrhagiae and Leptospira canicola.

Animal parasites which infest most dogs form somewhat of a menace to man. The most dangerous is Taenia echinococcus, which carries on its adult stage of life in the intestine of dogs while its larval stage is spent in the tissues of man or other animals. Another tapeworm which should be mentioned is Dipylidium caninum. Its larval stage occurs in lice and fleas which infest dogs, children becoming infected by accidentally swallowing such lice and fleas or crushing them and afterward sucking the fingers. The guinea worm, Dracunculus medinensis, has been found in both dog and man, while several flukes of dogs may be transferred to persons. Three forms of mange afflict dogs, only one of which is transmissible to man—sarcoptic. Among the four forms of ringworm from which dogs suffer, a rare case is passed to persons.

Dogs may become infected with various bacterial diseases from other animals but do not form a serious menace to man. Tuberculosis is contracted sometimes from association with tuberculous persons, from drinking infected cow's milk or from the offal of slaughter houses. Anthrax and glanders are sometimes contracted by dogs from eating animals that have died of those diseases. Infection with foot and mouth disease is difficult, as it is also with trichinosis. Dogs are not generally susceptible to the rodent diseases, but they may act as mechanical carriers of rat bite fever, in which infection has followed the bite of a dog which had recently fed on an animal dead of the disease. The same is possible with other rodent diseases. Sporotrichosis of dogs probably is only a slight menace to man. Rocky Mountain spotted fever infects dogs, while boutonneuse fever, which is closely related to spotted fever, finds its chief reservoir in that animal.

Dogs have been reported susceptible to the organism causing scarlet fever, and free access of a dog to a human case of the disease might be a menace to children.

Cats are fairly resistant to many of the human diseases. On rare occasions they have been found tuberculous from infected milk or meat. They are susceptible to glanders but rarely contract the disease naturally. They may become infected with rabies from contact with rabid dogs, forming a serious menace to children. Cats are hosts of several animal parasites, some of which are transferable to man. The liver fluke, Opisthorchis felineus, is common in Europe, while the closely related species Opisthorchis pseudofelineus is found in central parts of the United States. Both parasites are natural inhabitants of the cat, from which man is infected. The intestinal flagellate Giardia found in rats and mice is a variety of the human species, and cats have been found responsible in disseminating the infection. The dog tapeworm, Dipylidium canium, is harbored by cats also. Cats are relatively immune to the rodent diseases. They show slight susceptibility to plague and to tularemia but are relatively unimportant in the spread of each disease. Several instances are recorded in which rat bite fever followed the bite of a cat, but probably the cat was a mechanical carrier of the spirochetes picked up from eating an infected rat. While the relation of cats to diphtheria is a disputed point, Simmons reports two cats from which he obtained diphtheria bacilli. Cats may harbor the spirochetes of leptospirosis.

Reference:

Hull, T. G.: Diseases Transmitted from Animals to Man, ed. 2, Springfield, Ill., Charles C Thomas, 1941.

PEPSIN CHEWING GUM AND STOMACH ULCER

To the Editor:—**Has any work been done on the question of the pepsin in so-called pepsin chewing gum in relation to gastric and duodenal ulcers? Does chewing gum actually contain pepsin, and, if so, does the amount added to the stomach from chewing such gum have any effect on ulcer?**

George N. Hosford, M.D., San Francisco.

ANSWER.—As far as can be determined, no work has been done on the effect of pepsin chewing gum on gastric and duodenal ulcers. The tentative standards of identity discussed by the chewing gum industry with the Food and Drug Department about three and a half years ago contained the following statement:

"Pepsin chewing gum contains not less than 0.15 per cent by weight of U. S. P. Pepsin, the proteolytic activity of which has not been impaired in the process of manufacture of the chewing gum."

As far as is known, substantially all of this pepsin is chewed out of the gum within a few minutes and swallowed.

In view of the high peptic activity of the acid gastric juice present in patients with gastroduodenal ulcer, it is apparent that the pepsin content of chewing gum is too small to affect the course of the ulcer process.

It may be stated also that the increased amount of saliva secreted during the chewing of gum would tend to exert a neutralizing action on the acidity of the gastric juice and therefore reduce its peptic activity. Although the buffer capacity of "resting" saliva is low, the buffer capacity of saliva is increased considerably during active secretion. Resting saliva is stated to have a p_H of 6.6; the p_H may rise to 7.5 during profuse secretion. These values obviously are higher than those of acid gastric juice, which range usually from 1 to 2. Drs. Alexander Rush and A. B. Luckhardt (unpublished observations) have found that the swallowing of large amounts of saliva definitely decreases the acidity of the gastric contents obtained after histamine stimulation.

RIDGED FINGERNAILS—YELLOWING OF GRAY HAIR

To the Editor:—**Is there any agreement as to the cause of ridging in the finger nails which gives them a washboard appearance? Is this considered nutritional in origin? The patient is 68 years of age and is otherwise well. Is there any relation between this condition and the tendency for gray hair to assume a yellowish tinge?**

R. J. Jackson, M.D., Rapid City, S. D.

ANSWER.—Cross furrows and ridges in the finger and toe nails are among the commonest deformities of these structures. They may follow any accident, fever or other disturbance of health, appearing a short time afterward. Zeisler (Trophic Dermatoses Following Fracture, *J. Cutan. Dis.* **16**:305, 1896) gives an interesting account of his own experiments with Beau's lines. In a symposium on diseases of the nails at the twenty-fifth annual meeting of the American Dermatological Association the same author (Transactions of the American Dermatological Association for 1901, p. 126) lists as causes typhoid and typhus fevers, severe gastrointestinal disturbances, pneumonia, erysipelas, epididymitis, angina, parotitis, scarlet

fever, measles, influenza, acute rheumatitis and severe general trauma; "even the normal puerperium and sea sickness seem to have caused it occasionally." During the discussion Hartzell (p. 140) reported Beau's lines after a few days of sea sickness and Bulkley (p. 141) stated that he had seen a case of alopecia areata showing finger nail ridges which began simultaneously with the alopecia. Ormsby (Diseases of the Skin, ed. 5, Philadelphia, Lea & Febiger, 1937, p. 1267) mentions that Hyde told of the occurrence of Beau's lines after attacks of dyshidrosis. They are not ordinarily considered of nutritional origin, but spoon nails, another trophic disturbance that might be confused with the cross ridges, are often associated with severe anemia.

The yellow tinge assumed by gray hair in some persons has no relation to the cross furrows of the nails. The yellow hair color is a natural phenomenon connected in some persons with graying of the hair. In bleaching hair, according to Redgrove and Foan (Hair Dyes and Hair Dyeing. Chemistry and Technique, ed. 2, London, William Heineman, 1939, p. 182), it is found that red or blond hair is much more likely to remain yellow than hair of darker shades, which will bleach to white more readily. The only recourse seems to be the skilful application of blueing, to counteract at least to a degree the yellow tinge. This is the advice of Redgrove and Foan, who infer from this characteristic of blond and red hair that there are at least two kinds of melanin in human hair. Those who have investigated the chemical characteristics of the pigment of human hair are in agreement with this opinion (Arnow, L. E.: The Acid Soluble Pigment of Red Human Hair, Biochem. J. **32**:1281 [Aug.] 1938).

TREATMENT OF CHRONIC GONORRHEAL ARTHRITIS

***To the Editor:*—Can you give me any information on the treatment of gonorrhea with heat therapy or any other suggestion for treating chronic gonorrheal arthritis?** **J. Kimber LeVan, M.D., Carlisle, Pa.**

ANSWER.—It is most important to establish first that the patient is suffering from chronic gonorrheal arthritis and not chronic rheumatoid arthritis with an associated unrelated gonococcic infection. If the patient's history, physical examination and laboratory findings are consistent with a diagnosis of chronic gonorrheal arthritis, he can be treated in one of several ways:

Sulfathiazole, 4 Gm. initially and 1 Gm. every four hours day and night. The fluid intake should be constant and sufficiently great to insure a twenty-four hour urinary output of 1,500 to 1,800 cc. A daily fluid intake of 2,500 to 3,500 cc. is usually adequate. If the patient is to respond to sulfonamide therapy, one should observe real evidence of improvement within three to four days.

If the patient fails to improve under this form of therapy, one can then employ either fever therapy or fever therapy in conjunction with sulfonamide therapy, the latter being the more effective. Fever therapy can be administered in one or two ways: (*a*) by means of radiant energy or (*b*) by means of typhoid vaccine intravenously. The instructions to be employed in these two forms of treatment are listed:

FEVER PRODUCED BY RADIANT ENERGY

(The treatment is the same for patients not receiving sulfathiazole except that the drug is omitted.)

1. The patient should receive sulfathiazole 1 Gm. every four hours day and night for the preceding three days.

2. Administer 15 to 20 Gm. of salt daily for the two days before the fever therapy is to be administered.

3. Fever therapy:

(*a*) Light breakfast. One Gm. of sulfathiazole, to be repeated every four hours.

(*b*) Morphine sulfate 1/6 to 1/4 grain (0.01 to 0.015 Gm.) hypodermically and sodium amytal 1½ to 3 grains (0.1 to 0.2 Gm.) by mouth before placing the patient in the fever therapy box. The dose of drugs used will depend on the size of the patient. The morphine or other opiate can be repeated every two to three hours if necessary.

(*c*) Take temperature, pulse and blood pressure every fifteen minutes.

(*d*) The aim is to produce a temperature between 106 and 106.5 F. and maintain it for the desired period of time.

(*e*) Allow liquids (at room temperature) as desired. Encourage the patient to drink as much as 1 per cent saline solution or orange juice containing 1.5 per cent saline solution in order to prevent serious salt and water depletion. The fluid intake should be at least 5,000 cc. the day of treatment. When the procedure is finished, 1,500 to 2,000 cc. of isotonic solution of sodium chloride intravenously may or may not be indicated.

(*f*) If necessary, apply an ice bag to the head.

(*g*) A medical officer should always be in attendance or at hand.

FEVER THERAPY INDUCED BY MEANS OF TYPHOID VACCINE INTRAVENOUSLY

(The treatment is the same for patients not receiving sulfathiazole except for the omission of the drug.)

1. The patient should receive sulfathiazole 1 Gm. every four hours day and night for the preceding three days.

2. Administer 15 to 20 Gm. of salt daily for the two days before the fever therapy is to be administered.

3. Fever therapy schedule:

(*a*) Light breakfast. One Gm. of sulfathiazole, to be repeated every four hours.

(*b*) Following this place the patient in bed between woolen blankets. Keep the patient completely covered except for the head and neck.

(*c*) Place four hot water bottles (140 to 150 F.) in the bed. These should be replaced every thirty minutes throughout the day, care being taken not to uncover the patient when they are changed.

(*d*) Sodium amytal or some similar barbiturate preparation, 1½ to 3 grains by mouth, depending on the size of the patient.

(*e*) Morphine or other opiate hypodermically, depending on the size of the patient.

(*f*) After the patient has been in the warm bed for one hour, administer triple typhoid vaccine (50 million organisms) intravenously.

(*g*) Take temperature and pulse every fifteen minutes.

(*h*) Take blood pressure every fifteen to thirty minutes.

(*i*) If the temperature is not above 102 F. within two hours, give another 50 to 100 million organisms intravenously. This can be repeated again in another hour or two if necessary. The aim is to produce a temperature of 105 to 106 F. and maintain it as long as possible. Once the peak temperature is reached it can usually be sustained, provided the hot water bottles are changed regularly and without uncovering the patient.

(*j*) The opiate may be repeated every two to three hours if necessary.

(*k*) Allow liquids (at room temperature) as desired. Encourage the patient to drink as much 1 per cent saline solution or orange juice containing 1.5 per cent saline solution in order to prevent serious salt and water depletion. The fluid intake should be at least 5,000 cc. on the day of treatment. When the therapy is completed, 1,500 to 2,000 cc. of isotonic solution of sodium chloride intravenously may or may not be indicated.

(*l*) If the patient is too restless or has a headache, apply an ice bag to his head.

(*m*) A medical officer should always be in attendance or at hand.

SULFANILAMIDE ADDED TO TALCUM POWDER IN RUBBER GLOVES

***To the Editor:*—Recently, during an operation, one of my gloves was pricked with a needle and the talcum powder was spattered in the wound. Would it be harmful to the surgeon to add a small amount of sulfanilamide to the talcum powder? What percentage of sulfanilamide would give an additional safety factor to the doctor and the patient if the glove is punctured during an operation? Have there been any studies made on this problem?** **Harry Kirschbaum, M.D., Detroit.**

ANSWER.—There have not been studies on this problem reported. Possibly 10 per cent sulfanilamide added to the talcum powder might give protection to the surgeon. It is almost certain that this would not give protection to the patient.

SKIN REACTION FOLLOWING IRRADIATION

***To the Editor:*—On page 1262 of The Journal for Dec. 12, 1942, there is an item on "Treatment of Recurrent Hyperthyroidism." I think that the following statement is incorrect: "Moreover, there is some danger of burning the skin, which may happen under the most carefully controlled circumstances," referring to the use of x-ray irradiation in the treatment of hyperthyroidism. The term "burning of the skin" should not be used when referring to a skin reaction following irradiation. The careless use of this term is a cause of many damage suits. "Reaction" is an accurate term and is preferable. The statement that there is danger of "burning the skin" is misleading because only relatively small doses of x-rays are usually required in the treatment of hyperthyroidism and with the proper control of dosage there should be nothing more than a mild skin reaction.** **L. A. Pomeroy, M.D., Cleveland.**